REPORT

OCTOBER 2025

Corrective Action Construction Certification Report

LEDGE ROAD LANDFILL
ANDOVER, MASSACHUSETTS

Prepared for:

Town of Andover, Massachusetts

CDM Smith

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1.0 Introduction

CDM Smith prepared this Construction Certification Report on behalf of the Town of Andover (the Town) to document the closure of the Ledge Road Landfill in Andover, Massachusetts (the landfill). This report was prepared in compliance with condition 8E of the Administrative Consent Order (ACO) which the town entered with Massachusetts Department of Environmental Protection (MassDEP) on November 29, 2022. This report was prepared in accordance with MassDEP approvals and the MassDEP Solid Waste Management Regulations (310 CMR 19.000, the Regulations), specifically 310 CMR 19.107. The closure construction was completed in accordance with the Regulations and the Corrective Action Design (CAD) permit issued by the MassDEP and subsequent permit modifications. The work was also completed in accordance with the MassDEP Landfill Technical Guidance Manual (revised May 1997). This section outlines the site history and regulatory process and provides a summary of the approved CAD.

1.1 Site Description and History

The landfill is located just off Chandler Road and Greenwood Road, northeast of the intersection of Routes I-93 and I-495 in Andover, Massachusetts (see **Figure 1.1**). The 23-acre landfill is owned by the Town and the site is the responsibility of the Town's Department of Public Works (DPW). The former landfill is currently a large plateau extending from Ledge Road west to a wetland floodplain that extends west of I-93 to Fish Brook. The side slopes of the landfill adjacent to the wetland are steep and partially vegetated.

The landfill began operating shortly after the end of World War II. Historical mapping of the landfill area shows that the site was operated as a gravel pit around this same period. Dumping was conducted in an "open face" manner by filling in old gravel pits and burning until the early 1960s. Open burning was discontinued in November 1961, at which time the Town adopted sanitary landfill practices at the site. Town records indicate that the landfill was used for disposal of residential, commercial, industrial, and construction demolition wastes.

A perforated pipe underdrain system, located along the northern and western edges of the landfill, was constructed during the 1970s to divert surface and subsurface flow around the landfill to reduce leachate generation. The underdrain system is in a state of disrepair with exposed and broken pipes and collapsing manhole structures. A stormwater system collects runoff from along Ledge Road and diverts it along the southern and eastern perimeter of the landfill to the wetlands located downgradient of the landfill. These drainage systems may be acting as groundwater sinks, diverting groundwater from under the landfill into the downgradient wetlands.

In early 1972, while the landfill was still active, the Department of Public Health (DPH) issued a citation to the Town for violations of solid waste regulations. The citation indicated that the landfill was located in the watershed of Fish Brook, a contributing source of water supply for Andover, and that leachate emanating from the landfill was contaminating a tributary brook to Fish Brook. This prompted the DPH to issue an Order in December 1972 that instructed the Town to construct an underdrain system to capture and re-route upgradient groundwater flow around the landfill, thereby, providing a pollution control benefit as such action was meant to help limit the generation of leachate to the adjacent

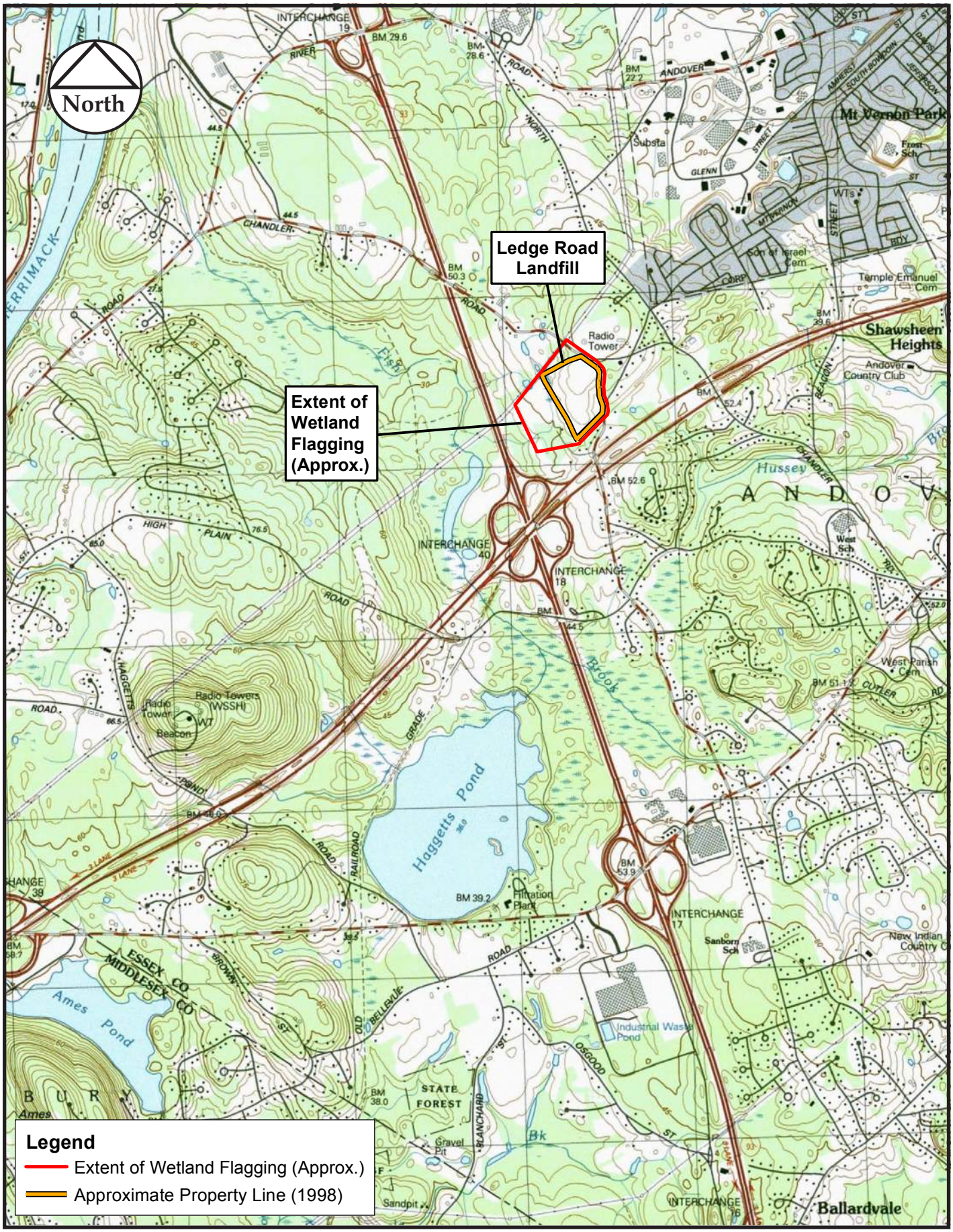
downgradient wetlands. The Order also instructed the Town to prepare to close the landfill. The landfill ceased operations in 1972, and the Town began the collection and disposal of waste at out-of-town facilities.

In the early 1980s, a large portion of the northern section of the landfill was covered with a low permeability soil and was used until the fall of 2016 as baseball and soccer fields for Town residents. During the period that the fields were in use, the fields were surrounded by fencing that restricted access to other portions of the landfill site. The remaining southern portion of the landfill site was used by the DPW for stockpiling and processing of brush and inert materials, including street sweepings and catch basin cleanings.

There are residential areas to the south of the landfill, along Greenwood Road and Pettingell Avenue. In addition, there are residences across from the landfill on Greenwood Road to the east and slightly north along Chandler Road. A former livestock pig farm is located to the north and northwest of the landfill, this property was recently acquired by the Town. To the northeast, there is a transmitter station for a local radio station and the Town's West Fire Station.

The area to the west of the landfill is a large wetland system that is tributary to Fish Brook, which serves as a very small portion of the Town of Andover's drinking water supply. Specifically, there is an impoundment at the Fish Brook outlet to the Merrimack River that holds water from Fish Brook and the Merrimack River during certain parts of the year. A pumping station pumps water from the impoundment to Haggetts Pond via a 2.85-mile long transmission main. The Andover Water Treatment Plant (WTP) intake is located in Haggetts Pond. The actual volume of water contributed by Fish Brook to the Merrimack Impoundment located at the Fish Brook outlet is only a minor portion of source water when compared to the intake from Haggetts Pond. Furthermore, this source of drinking water is only used seasonally when Haggetts Pond water level recedes. Since the small impoundment of Fish Brook by the outlet to the Merrimack River is a part of the Town's water supply, Fish Brook is classified as a Class A Surface Water Source as defined by 314 CMR 4.05(3)(a). Consequently, Fish Brook and the headwater wetlands just downgradient of the landfill are designated as Outstanding Resource Waters (ORW) (314 CMR 4.06). The Fish Brook watershed is further protected on the local level under the Fish Brook/Haggetts Pond Watershed Protection Overlay District (WPOD).

Since 1995, the Town has been working toward landfill closure to meet MassDEP Solid Waste Management Regulations (310 CMR 19.000). Once elevated concentrations of arsenic were detected in soil samples collected from wetlands downgradient of the landfill in 2006, the site became subject to the MCP. The chronology of regulatory Solid Waste/MCP submittals and approvals in **Appendix A** includes key regulatory communications and approvals.



0 2,000 4,000

Scale in Feet

Town of Andover, Massachusetts
Ledge Road Landfill Closure Project

Figure 1.1
Project Location Map

CDM Smith

1.2 Regulatory Process

1.2.1 MassDEP Solid Waste

Corrective Action Design Permit Applications (BWP SW 25), and Major Post-Closure Use Permit Applications (BWP SW 36) for the Ledge Road Landfill were originally submitted to the MassDEP Northeast Regional Office, Bureau of Air and Waste, Solid Waste Management Section (MassDEP Solid Waste) on June 30, 2022 (Transmittal Number X275420). A supplemental transmittal providing revisions to the CAD design plans requested by MassDEP Wetlands was submitted on November 3, 2017. In response to a Notice of Technical Deficiency from MassDEP Solid Waste dated December 14, 2017, CDM Smith, on behalf of the Town, submitted an additional supplemental transmittal on March 16, 2018. MassDEP Solid Waste issued a Provisional Decision on April 30, 2018, and Approval and Authorization to Construct – Final Decision on May 3, 2019. The MassDEP Solid Waste Authorization to Construct expired on May 3, 2022. The Town submitted a request for an extension of the authorization to MassDEP on May 13, 2022; however, the extension was not received.

The May 13, 2019, Approval and Authorization to Construct – Final Approval included approval of a post-closure use consisting of a DPW Materials Handling Area. Following expiration of the original CAD, the Town decided not to construction the DPW Materials Handling Area on top of the landfill. On November 21, 2022, CDM Smith submitted a Major Modification Permit Application (BWP SW 11) for the previously approved CAD for the purpose of removing the DPW Materials Handling Area post closure use. As the post-closure use had been removed, a Post-Closure Use Permit from MassDEP Solid Waste was no longer required. A future Post-Closure Use Permit application(s) will be required for any post-closure used such as a solar array and/or walking trails if the Town decides in the future to move forward with these or any other post-closure uses. MassDEP Solid Waste issued a Provisional Decision on April 12, 2023, and Approval and Authorization to Construct – Final Decision on May 16, 2023 (the Approval).

The Town entered into an Administrative Consent Order (ACO) with the MassDEP on November 29, 2022, to complete remaining landfill closure activities at the Ledge Road Landfill. The ACO requires that:

- The landfill cap be substantially complete by June 30, 2025.
  - The landfill cap was substantially completed on October 30, 2025 with the seeding of the entire landfill.
- Submission of a category BWP SW43 “Landfill Closure Completion” for the certification of closure construction by November 1, 2025.
  - This requirement is fulfilled by the submission of this report.

A deed notice to the properties where landfilled waste remains is required as part of the Notice of Landfill Operations under 310 CMR 19.141. These include Parcels 2, 4 and 7 on Town of Andover Assessors Map 147.

1.2.2 Massachusetts Contingency Plan

The site has been subject to the MCP (RTN 3-27632) since April 2008 when it was determined that elevated concentrations of arsenic in wetland soils at the site constituted a potential Imminent Hazard condition. An Immediate Response Action (IRA) Plan was submitted to the MassDEP to address the potential Imminent Hazard condition on June 20, 2008. MassDEP issued an approval of the plan in correspondence dated July 31, 2008. The original IRA Plan proposed administrative controls (signs, gates, repair of fencing, removal of pedestrian bridges, and periodic inspections) to limit public access to the contaminated wetland areas pending completion of the CAAA to evaluate long term remedial plans to address the impacts to downgradient wetlands and streams. Following acceptance of the CAAA and Corrective Action Design (CAD) to address landfill closure and wetland impacts, CDM Smith submitted an IRA Plan Modification to MassDEP on August 21, 2023. The IRA Plan Modification described the proposed response to address arsenic contamination in downgradient wetlands and streams consisting of hotspot removal and capping of the landfill. This IRA Plan Modification was accepted by MassDEP on September 6, 2023. IRA activities were documented in semi-annual IRA Status Reports.

Initial IRA activities performed included collection of wetland soil samples in the wetlands and abutting properties, removal of a footbridge, installation of gates to limit site access, and posting of no trespassing signs indicating areas where sediments are contaminated. Semi-annual inspections of the signs and gates are performed to ensure they are maintained. Following MassDEP Acceptance of the IRA Plan Modification, wetland soil with arsenic concentrations exceeding the site-specific cleanup standard of 900 mg/kg were removed from the downgradient wetlands and placed under the impermeable cap of the landfill during landfill closure construction. The impermeable cap will prevent access to the wetland soil and will prevent stormwater from infiltrating through it and landfill waste. By preventing stormwater infiltration, the impermeable cap will reduce the generation of landfill leachate and the associated reducing conditions, thereby mitigating the concentrations of arsenic and iron in groundwater, surface water, and wetland sediment downgradient of the landfill.

Following completion of IRA activities and landfill closure construction, in accordance with the MCP 310 CMR 40.0427, the IRA is considered complete. The conditions that gave rise to the need for the IRA have been assessed and, where necessary, remediated to the extent that necessary stabilization of site conditions has been accomplished; Imminent Hazards to health, safety, public welfare, and the environment have been eliminated or controlled; and time-critical measures addressing the elimination, prevention, or mitigation of any Critical Exposure Pathway(s) have been completed. An IRA Completion Report was submitted to MassDEP on August 27, 2025.

With the completion of the IRA and the submittal of the IRA Completion Statement the Site will continue to be Adequately Regulated, pursuant to 310 CMR 40.0110-0115, under the Solid Waste Management regulations. The capping of the landfill was approved by MassDEP within the Corrective Action Design Major Modification Permit submitted on November 21, 2021, and includes monitoring of the wetland soils. It is expected that the water table will lower below the vertical limits of waste over a period of 5 years. During that time, the wetland soil excavation areas will be monitored for recontamination. Once the water table is lowered below the waste material, it is expected that a condition of No Significant Risk will exist for the wetland. Documentation of the wetlands soil monitoring results will be submitted to MassDEP under the Solid Waste Management program.

1.2.3 Public Involvement Plan

On September 27, 2005, the Town received a petition from residents of Andover requesting that the former Ledge Road Landfill be designated as a Public Involvement Plan (PIP) site, in accordance with MGL c21E 14(a). Therefore, a PIP was developed for the former Ledge Road Landfill site, which was distributed for public comment on January 19, 2006, and finalized on July 31, 2006. Because the former Ledge Road Landfill is a PIP site, it is subject to the additional public involvement activities for PIP sites of the MCP (310 CMR 40.1405). As such, this IRA Completion Report is subject to a 20-day comment period. Notification of the public comment period will be sent to the PIP mailing list.

Public involvement activities subject to the PIP will continue following submission of the IRA Completion Report. As such, this Construction Certification Report is subject to a 20-day comment period. Notification of the public comment period will be sent to the PIP mailing list. As the site will be entering the 30-Year Post-Closure Monitoring and Maintenance period, the public involvement requirements of the MCP for Phase V (310 CMR 40.0895) apply. Notices of document availability for post-closure monitoring reports will be distributed to the PIP mailing list semi-annually. In addition, those on the PIP mailing list will be notified of any required notifications to MassDEP as well as, in accordance with 310 CMR 40.1403(3)(a), specific types of field work (e.g., sampling that involves the use of a respirator or other protective clothing, private drinking water sampling, indoor air sampling, surface soil sampling at a residential property). This requirement does not apply to routine groundwater, surface water, wetland soil, or landfill gas sampling.

1.2.4 MEPA Process

The landfill closure project was subject to review under MEPA. Based on review of the Environmental Notification Form (ENF), MEPA determined that an Environmental Impact Report (EIR) for this project is not required (see ENF Certificate issued November 4, 2016 included as Appendix A).

As part of the MEPA review, the Massachusetts Historical Commission confirmed that the project is unlikely to affect significant historic or archaeologic resources (MHC, July 27, 2016). In addition, NHESP confirmed that the project site is not mapped as priority or estimated habitat (NHESP, August 8, 2016).

1.2.5 Other Environmental Permits

Table 1.1 presents the status of other environmental permits required for the project. Environmental permits received are provided in Appendix A.

Table 1.1 Other Environmental Permits

Regulatory Level	Permit	Description	Status
Federal (USACE)	U.S. Army Corps of Engineers (USACE) Programmatic General Permit Pre-Construction Notification (PCN) under General Permit 17 Cleanup of Hazardous and Toxic Waste	Work in wetlands and waterways are regulated by the USACE under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. Authorization under the General Permit is required because the project permanently impacts greater than 5,000 square feet of wetlands. An individual permit is not required because the project permanently impacts less than one acre.	The PCN was submitted on January 6, 2017. Authorization received November 14, 2018. Authorization required In-Lieu-Fee as compensation for permanent wetland loss. Town paid In-Lieu Fee on March 2, 2020. Authorization requires that work commence by April 5, 2023 and complete by April 5, 2024 – Extension will be required. Amendment submitted for removal of post-closure use on November 24, 2022 and approved on, on April 20, 2023, ACOE notified CDM Smith that a modification to the permit is not necessary since there is no change to the footprint of the project.
State (MassDEP)	401 Water Quality Certificate (WQC)	Section 401 of the Clean Water Act requires that states certify that federal actions will not prevent the attainment of state water quality criteria. This permit is required because a permit is required from the USACE, and the project will alter more than 5,000 square feet of wetlands	The 401 WQC application was submitted on January 20, 2017. 401 WQC received on May 15, 2018. Amendment submitted for removal of post-closure use on November 23, 2022.
Local (Andover Conservation Commission)	Town of Andover Wetland Bylaw - Order of Conditions	Under the Town of Andover Wetland Bylaw, alterations of wetland resource areas and work adjacent to certain resource areas, require issuance of an Order of Conditions by the local Conservation Commission.	Notice of Intent was submitted on November 15, 2017. Order of Conditions issued May 23, 2017. Expiration date extended to May 23, 2023. Additional extension required. Amendment submitted for removal of post-closure use on November 18, 2022 and approved on January 5, 2023.

Regulatory Level	Permit	Description	Status
State (MassDEP)	Superseding Order of Conditions	Under the MWPA (M.G.L. c.131s.40) and its regulations (310 CMR 10.00) – Appeal of Order of Conditions from local Conservation Commission required issuance of Superseding Order of Conditions from MassDEP	Superseding Order of Conditions issued April 17, 2018. Expiration date extended to April 17, 2024. Additional extension required. Amendment submitted for removal of post-closure use on November 18, 2022 and approved on March 21, 2023.
Federal (USEPA)	NPDES Construction General Permit	Authorization under this permit is needed for any construction exceeding one acre. A SWPPP addressing erosion and sedimentation controls and treatment, and the ultimate discharge of stormwater must be prepared.	This permit and SWPPP were completed and submitted by the Contractor prior to construction on August 28, 2023.

1.2.6 Construction Notification

On September 25, 2023, in accordance with Condition No. 5(b) of the Approval, CDM Smith, on behalf of the Town, submitted notification to MassDEP and the Town of Andover Director of Public Health that the construction of the Ledge Road Landfill Closure was commencing. As required by Condition No. 5(b) of the Approval, the notification included the projected schedule for completion of the project and major construction milestones; the name and contact information for the Engineer of Record for the project, the name and contact information of the on-site contact for the project, the National Pollutant Discharge Elimination System (NPDES) Notice of Intent and Stormwater Pollution Prevention Plan (SWPPP) for the project, and the Health and Safety Plan for the Project. A copy of this notification is included in Appendix A.

1.3 Corrective Action Design Summary

The approved CAD Major Modification includes the following components:

1.3.1 Landfill Capping

The former 23-acre municipal Ledge Road Landfill was capped with an approved alternative landfill final cover system design that includes a synthetic impermeable liner, installation of passive landfill gas controls, and a new stormwater management system consistent with Best Management Practices (BMPs). Capping will eliminate infiltration of precipitation into the landfill, thereby lowering the groundwater table and reducing the mobilization of naturally occurring arsenic and iron to downgradient areas.

1.3.2 Wetland Soil Hotspot Removal

Arsenic impacted soils were removed from downgradient wetlands to satisfy requirements of the MCP as well as the MassDEP Solid Waste Management Regulations (310 CMR 19.000). The occurrence of arsenic in downgradient groundwater and wetland soil is due to the landfill mobilizing naturally

occurring arsenic and resulted in the issuance of MassDEP Release Tracking Number (RTN) 3-27632 per the MCP. Based on the site specific Human Health Risk Assessment, excavation and removal of arsenic impacted soils with concentrations in excess of 900 mg/kg, was necessary to achieve a Condition of No Significant Risk as defined under the MCP. Once removed, arsenic impacted soils were disposed within the capped landfill and impacted wetland resource areas were restored in-kind. Based on confirmation testing, some removal areas were expanded during construction. Final confirmation testing confirmed that all wetland soil with arsenic concentrations above 900 mg/kg had been removed.

2.0 Modifications to the Design

The Town previously submitted a Corrective Action Design (CAD) Report and Post-Closure Use Permit Application for the Ledge Road Landfill to the MassDEP Northeast Regional Office, Bureau of Air and Waste, Solid Waste Management Section (MassDEP Solid Waste) on June 30, 2022 (Transmittal Number X275420). A supplemental transmittal providing revisions to the CAD design plans requested by MassDEP Wetlands was submitted on November 3, 2017. In response to a Notice of Technical Deficiency from MassDEP Solid Waste dated December 14, 2017, CDM Smith, on behalf of the Town, submitted an additional supplemental transmittal on March 16, 2018. MassDEP Solid Waste issued a Provisional Decision on April 30, 2018 and Approval and Authorization to Construct – Final Decision on May 3, 2019. MassDEP Solid Waste's Final Decision is provided in Appendix A.

A CAD Major Modification to the previously approved CAD was submitted on November 21, 2022 that removed the post-closure use. The original CAD Report and Post Closure Use Permit Application requested approval for a post-closure use consisting of a Department of Public Works (DPW) Materials Handling Area. The Town ultimately decided not to construct the DPW Materials Handling Area on top of the former Ledge Road Landfill. Therefore, the previously approved design plans were modified to remove the DPW Materials Handling Area. Modifications to the original design include removal of all features related to the DPW Materials Handling Area, revised grading plans, and revised stormwater control system. Other components of the selected CAAA including wetland remediation and restoration and wetland replication remain unchanged. The Town currently has no post-closure use planned for the former Ledge Road Landfill. Approval of any potential future post-closure use such as a solar photovoltaic (PV) array or walking trail would be requested through a separate Post-Closure Use Application. The 2022 revised design report also reflects changes described in the March 16, 2018 response to Notice of Technical Deficiency. MassDEP requested annotated plans noting the changes to the previously approved designs, which were provided on February 28, 2023. MassDEP Solid Waste issued a Provisional Decision on April 12, 2023, and Approval and Authorization to Construct – Final Decision on May 16, 2023

Incorporating the major modifications approved on May 16, 2023, the proposed CAD was constructed in substantial conformance with the MassDEP approved design plans and specifications. Design modifications were implemented during the construction for unanticipated field conditions that required changes to components of the CAD be implemented. The following sections describes modifications to the approved designs with as-built information reflected in the Record Drawings in **Appendix B** and described further in other sections of this report.

2.1 Modifications to the MassDEP Approved Design

The following are the design changes made to the plans and specifications approved by MassDEP as well as other revisions caused by field conditions encountered during construction.

2.0 Modifications to the Design

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2.1 Modifications to the MassDEP Approved Design

The following are the design changes made to the plans and specifications approved by MassDEP as well as other revisions caused by field conditions encountered during construction.

Some unanticipated conditions were discovered during construction, these are detailed below:

- During construction, the total quantity of waste that was relocated and condensed into the landfill prior to capping was more than anticipated. The additional material was excavated based on visual observations of waste material. Soil samples were collected at from the sidewalls and bottom of the excavation once visually non-impacted material was reached. The additional volume of waste material excavated did not results in any appreciable changes in grading. As the landfill was shaped, more settling than expected was observed. As a result, the plateau of the landfill was lowered by approximately 1 foot. The final subgrades are reflected in the Contractor As-Built files and Record Drawings in Appendix B.
- An asbestos-cement pipe related to the underdrain system installed in the 1970s was encountered within one of the waste relocation areas. The contract documents stated the pipe should abandoned in place and the excavation of waste material would occur around it. After uncovering the pipe, it was determined that excavation around the pipe was infeasible, and the pipe was instead removed within the waste relocation area. The asbestos-cement pipe encountered in the waste relocation excavation was removed, containerized, and shipped off site by AirSafe of Hopkinton, MA, under subcontract to the construction contractor, J. Bates and Son, LLC. Four Brothers Environmental of Greenland, NH, a Commonwealth of Massachusetts licensed Asbestos Project Monitor, completed an asbestos visual inspection of the project area and did not identify any visible dust, debris, or residue. The Four Brothers Asbestos Air Clearance Report and Certificate of Visual Inspection are included within the January Construction Monitoring report attached in **Appendix C**.
- Condition 32 of the Amended Order of Conditions issued by the Town of Andover Conservation Commission stipulates that work within intermittent streams including preparation, excavation, backfill, and restoration be limited to July 1 – September 30 and work within Bordering Vegetated Wetland (BVW) areas be limited to June 15 – October 15. Excavation of the arsenic impacted wetland soil was originally planned to occur during the summer of 2023 during dry, low flow conditions leading up to the end of September. However, due to the unusually high amounts of rainfall during the summer of 2023 (20.59 inches of rain between July 1st and August 18th), there was a significant amount of water in the wetlands making the excavation of wetland soils infeasible. Delaying this work to summer 2024 to comply with the Time-of-Year restrictions would have resulted in significant project delays that could result in failure to meet deadlines prescribed in the ACO.

  The Town of Andover Conservation Commission approved an Insignificant Change to the Order of Conditions at their September 5, 2023, meeting to allow wetland soil excavation to occur during the winter when the ground is sufficiently frozen, dry, or otherwise stable to support the equipment being used to complete the excavation. This approval is included in Appendix A. The winter of 2023-2024 was unusually warm and the ground in the wetland excavation areas did not freeze. Therefore, wetland excavation activities occurred in the early spring 2024 when the ground was sufficiently dry to support the excavation equipment.
- The groundwater elevations observed after the initial excavation for the wetland replication area was approximately a foot lower than the expected seasonal low groundwater elevation.

The grades in the wetland replication area were lowered by approximately one foot in some areas to achieve wetland hydrology in the replication area. The record drawings in Appendix B reflect this change.

- Following the installation of landfill gas monitoring wells, quarterly landfill gas monitoring in December 2024 and March 2025 showed methane concentrations exceeding 25% LEL at landfill gas monitoring well LFG-9. As a result, the horizontal gas collection trench along the southern property boundary was extended approximately 150 feet along the constructed anchor trench east of the double-lined wetland basin, between the basin and Greenwood Road, to new landfill gas monitoring well LFG-10, where landfill gas has not been detected. This change was proposed to MassDEP on May 19, 2025 and approved on May 22, 2025 and was constructed June 11th through June 17th. The approval from MassDEP is included in Appendix A. Landfill gas has not been detected at LFG-9 since the construction was completed.

3.0 Corrective Action Construction

3.1 Introduction

The CAD required numerous procedures and tests to confirm that the constructed work was completed in accordance with the MassDEP Approval, the Regulations, and the Landfill Technical Guidance Manual. The results of material and installation testing and onsite observation of the corrective action construction are summarized in this section.

The project Contractor, J. Bates and Son, LLC implemented the corrective action construction activities on the site beginning in September 2023. Closure construction was considered substantially complete on March 7, 2025; however, construction activities to ensure the establishment of turf and success of the plantings and to monitor the wetland replication and restoration continued after that date. CDM Smith performed full-time construction monitoring during construction and prepared Daily Reports. As the Engineer of Record and Certifying Engineer for the project, CDM Smith performed routine inspections during construction including periodic inspections at least monthly during construction; and a final inspection on October 14, 2025.

As required by MassDEP's approval, CDM Smith submitted monthly Construction Monitoring Reports to MassDEP documenting construction activities at the time of CDM Smith's inspections, identifying actual or potential deviations from the Regulations or approvals, and actions taken or intended to be taken to correct the deviations. Monthly Construction Monitoring Reports prepared by CDM Smith staff, including photographs documenting construction progress, are included in Appendix C.

The closure construction was completed under a Construction Quality Assurance/Quality Control (QA/QC) plan presented in the CAD and supplemental applications. The purpose of the QA/QC plan is to provide a set of guidelines and specific requirements to be followed to document that all closure-related construction activities are performed in strict accordance with the MassDEP approval and the Regulations.

3.2 Waste Relocation and Consolidation

The Ledge Road landfill began operating shortly after the end of World War II, and stopped receiving municipal solid waste in approximately 1972, and as such, the final extents and limits of the landfilled waste received and disposed at the site were not readily available in records. In order to determine the edge of landfilled waste at the Ledge Road Landfill, CDM Smith conducted several test pitting programs (1999, 2009, 2015, 2016), with locations selected based upon available landfill operations details, historic topography pre-dating landfilling operations, existing grade topography, and field observations of observed waste. Test pitting was performed along the perimeter of the landfill to locate the edge of landfilled waste in the wetland and wooded areas, and limited test pitting was performed along Chandler Road and Greenwood Road to confirm the edge of waste extent and depth along the Town of Andover roads.

Based on the results of the edge of landfilled waste investigations, five areas requiring waste relocation were identified. These include areas of off-site waste (i.e., on private property), waste in wetland areas, and waste along Chandler Road that needed to be pulled back to install the landfill gas management system infrastructure associated with the passive gas trenches. Waste relocation excavations were completed between January 2, 2024, and February 5, 2024. The estimated and actual volume of waste material relocated from each area are summarized below in **Table 3.1**.

Table 3.1 Quantity of Waste Relocation by Area

Waste Relocation Area (WRA)	Estimated Volume (cubic yards)	Actual Volume (cubic yards)	Location
WRA-1	650	6,579	Northwestern downgradient corner
WRA-2	150	2,864	Northern upgradient corner
WRA-3	300	870	Western downgradient edge
WRA-4	170	435	Southern downgradient corner
WRA-5*	700	2,410	Southern downgradient corner

*This area included off-site waste, which was removed under a temporary construction easement.

A total of 13,158 cubic yards of waste was removed and relocated into the landfill area. Note, even though the volume of waste moved under the landfill cap was higher than anticipated, no significant changes to the grading plan were required. As discussed above, more settling than anticipated was encountered and the plateau of the landfill was lowered by approximately one foot.

3.2.1 Confirmatory Testing

Although test pitting was completed ahead of time to define the limits of excavation the final extents were determined by visual inspection and confirmed via analytical testing for the following parameters:

- MCP-14 Metals by EPA Method 6010/7000
- Polycyclic Aromatic Hydrocarbons (PAHs) by EPA Method 8270
- Total Petroleum Hydrocarbons (TPH) by MassDEP Methods
- Polychlorinated Biphenyls (PCBs) by EPA Method 8082

Results from confirmation sampling were compared to RCS-1 as established in the Massachusetts Contingency Plan (MCP, 310 CMR 40.0000).

Following excavation, all confirmation samples in Waste Relocation Area 2 through Waste Relocation Area 5 were below RCS-1 Criteria. Both samples collected from Waste Relocation Area 1 (WRA-1-N and WRA-1-S) exceeded RCS-1 criteria:

- WRA-1-N exceeded RCS-1 criteria for zinc

- WRA-1-S exceeded RCS-1 criteria for antimony, lead, and zinc

After additional excavation, ten grab samples for MCP 14 metals were collected from WRA-1 (WRA-1-N-1 through WRA-1-N-5 and WRA-1-S-1 through WRA-S-5). All samples met RCS-1 criteria except for WRA-1-N-4, which exceeded RCS-1 criteria for arsenic. Since Waste Removal Area 1 is directly adjacent to the downgradient wetlands, where elevated arsenic concentrations are a known site contaminant, the observed arsenic levels are likely attributed to the wetlands. The sample result did meet the site-specific cleanup standard for arsenic of 900 mg/kg. Additionally, arsenic did not exceed RCS-1 in the original samples, further indicating that these concentrations are not related to residual waste material impacts.

Sample results are presented in **Appendix D**.

3.3 Wetland Soil Hot Spot Excavation

The conceptual hydrogeologic model for the site, which was developed based on information collected during the various phases of investigation, suggests that stormwater infiltration and the presence of the water table within the lower vertical limits of waste results in the generation of landfill leachate, which creates reduced groundwater conditions beneath the landfill. The reducing conditions mobilize the naturally occurring arsenic in the surficial geologic deposits resulting in elevated concentrations of arsenic in the groundwater. When the groundwater discharges to the surface water bodies downgradient of the landfill, arsenic and iron present in the groundwater is oxidized, co-precipitates, and is deposited onto wetland soils.

The precipitation of iron and arsenic results in elevated concentrations of arsenic in wetland soils. Installation of an impermeable solid waste cap will prevent infiltration of stormwater through the landfill, which will reduce generation of leachate. In addition, groundwater model simulations developed of the site show that the water table will be lowered below the vertical limits of waste within five years across a large portion of the landfill, including that area from which migration of the highest arsenic concentrations in groundwater appear to be occurring. Eliminating stormwater infiltration and lowering the water table below waste is expected to curtail the development of landfill leachate and associated reducing conditions, thereby mitigating the concentrations of arsenic and iron in groundwater, surface water, and sediment downgradient of the landfill. In the immediate term, the most impacted wetland soils will be removed and placed beneath the landfill cap to reduce the average concentration of arsenic in wetland soils to eliminate the Imminent Hazard and achieve a Condition of No Significant Risk for wetland soils.

3.3.1 Confirmatory Testing

All wetland soil sampling results are presented in **Table 1** through **Table 7** of **Appendix E**. All sample locations are shown on **Figure 1** and **Figure 2** of Appendix E. The full laboratory analytical reports have been included in Appendix E. Following excavation, thirteen confirmation samples were above the 900 mg/kg standard, in all instances, the wetland soil excavations were expanded, and additional confirmation samples were collected. These are discussed below:

- Two sidewall samples taken from hotspot number 3 (WE-3-SW-5 and WE-3-SW-6) exceeded the site cleanup standard at concentrations of 2380 mg/kg and 1710 mg/kg, respectively.

- The excavation was extended at WE-3-SW-5 to the north as shown on Figure 1 of Appendix E and a new sidewall sample was collected at the limit of the excavation; arsenic was detected at a concentration of 28.1 mg/kg, well below the site-specific standard of 900 mg/kg.
- The excavation at WE-3-SW-6 was extended outward to the northwest to connect with Wetland Excavation Area 4. Following the excavation of Wetland Excavation Area 4, WE-4-B-6 was collected where it connected with Wetland Excavation Area 3 and had an arsenic concentration of 73.4 mg/kg, below 900 mg/kg.

- Sample WE-5-B-3, collected from the bottom of Wetland Excavation Area 5 (Figure 2) contained arsenic at a concentration of 1840 mg/kg.
  - The area surrounding the sample was scraped and five bottom samples were collected at the original sample location and in 10 feet in each direction. The arsenic concentrations for the replacement confirmation samples WE-5-B-3-1, WE-5-B-3-2, WE-5-B-3-3, WE-5-B-3-W and WE-5-B-3-E were all below the 900 mg/kg cleanup standard with concentrations ranging from 9.57 mg/kg to 150 mg/kg.
- In Wetland Excavation Area 5 (Figure 2), sidewall samples WE-5-SW-3, WE-5-SW-5, and WE-5-SW-6 exceeded the site-specific cleanup standard of 900 mg/kg with arsenic concentrations of 2500 mg/kg, 2270 mg/kg, and 1290 mg/kg, respectively. The excavation was expanded at all of these sampling locations.
  - Delineation sample WE-5-SW-3A was collected with a hand auger approximately 10 feet from WE-5-SW-3 prior to the expansion of the excavation and contained arsenic at a concentration of 1260 mg/kg. A delineation sample (WE-5-SW-3B) was also collected between WE-5-SW-3 ad WE-5-SW-3A as a possible delineation point but was not analyzed as WE-5-SW-3A exceeded 900 mg/kg. Since the arsenic concentration was still above 900 mg/kg two additional delineation samples (WE-5-SW-3C, and WE-5-SW-3D) were collected an additional 5 and 10 feet to the east. WE-5-SW-3C contained arsenic at a concentration of 512 mg/kg. The excavation was then extended to the WE-5-SW-3C.
  - Prior to expanding the excavation at WE-5-SW-5, delineation samples WE-5-SW-5A, WE-5-SW-5B, WE-5-SW-5C, and WE-5-SW-5D were collected with a hand auger at 5 feet increments from WE-5-SW-5. WE-5-SW-5A and WE-5-SW-5B both contained arsenic concentrations above 900 mg/kg (1280 mg/kg and 2700 mg/kg), so the excavation was expanded to WE-5-SW-5C, which contained arsenic at a concentration of 213 mg/kg.
  - Prior to expanding the excavation at WE-5-SW-6, delineation samples WE-5-SW-6A, WE-5-SW-6B, WE-5-SW-6C, and WE-5-SW-6D were collected with a hand auger at 5 feet increments from WE-5-SW-6. WE-5-SW-6A and WE-5-SW-6B both contained arsenic concentrations above 900 mg/kg (2820 mg/kg and 1100 mg/kg), so the excavation was expanded to WE-5-SW-6C, which contained arsenic at a concentration of 630 mg/kg.
- There was a berm of upland material that extended into Wetland Excavation Area 5, to confirm that the material could remain in place, sidewall samples were collected on both sides of the

berm. One of the samples collected on the side of the berm (WE-5-BSW-2) contained arsenic at a concentration of 984 mg/kg, exceeding the 900 mg/kg site specific cleanup standard.

- The side of the berm was scraped with the excavator bucket and WE-5-BSW-2-R (0-0.5) was collected and contained an arsenic concentration of 1070 mg/kg. Approximately 2 additional feet of the berm was then removed, and another sample (WE-5-BSW-REDO) was collected. The arsenic concentration at WE-5-BSW-REDO was 205 mg/kg.

Following the wetland soil excavation, all confirmation samples were below 900 mg/kg, demonstrating the elimination of the imminent hazard under the MCP.

3.3.2 Waste Management

Wetland soils were directly transported from the wetland areas to the landfill using designated access roads within the project area, as shown on Drawings C-7 through C-9 of the Drawings in Appendix B and disposed under the landfill cap before landfill cap construction in accordance with the MassDEP-approved CAA. Wetland soils did not leave Town-owned property nor were they transported on public roads.

MassDEP regulations require that materials disposed in landfills not contain free liquids. The intent was to excavate wetland soils when the soils were sufficiently dry so as not to contain free liquids. However, depending on weather conditions at the time of construction, this was not possible for all areas. If the wetland soils were not sufficiently dry at the time of excavation, the soils were loaded into lined trucks to contain liquids for transport to a designated drying area atop the landfill (see Sheet G-4 of the Drawings in Appendix B).

The wetland soil was dried only if free liquids were present and only to the point that free liquids were no longer present. Since the only contaminant in the wetland soil is arsenic, odors were not a concern. Because the wetland soil was only dried to the point that it no longer contains free liquids, the generation of windblown dust did not occur during the drying process. Following placement in the landfill, the wetland soil was immediately covered with at least 6” of cover soil to prevent further drying and the potential for the generation of arsenic-containing dust.

Wetlands soils were not disposed in the landfill until free liquids were no longer present. Excavated soil was mixed with lime, which served as a drying agent. Once it was determined that wetland soils do not contain free liquids, the soils were disposed beneath the cap in the area designated on Sheet C-7 of the Drawings in Appendix B.

3.4 Subgrade Preparation

Subgrade preparation at the site consisted of grading and shaping with materials already on site including relocated waste materials and wetland soil to achieve the final approved pre-capping grades. All relocated waste and wetland soil excavated from the hot spots was placed within the landfill in accordance with MassDEP's Solid Waste Management Regulations including requirements for daily cover and controlling odors and dust. The material used for the bedding layer for the flexible membrane liner (FML) landfill cap consists of a 6-inch layer of coarse sand to serve as a path for landfill gas to

migrate to passive landfill gas vents and to provide protection for the FML from the waste materials that lie below.

Final subgrade slopes on the landfill cap were maximum of 3H: 1V with a plateau area on top having a minimum slope grade of 5 percent. The final surface of the grading and shaping materials was constructed to provide a smooth, uniform surface free from sudden changes in grade, rocks, stones, debris, and other materials that would be deleterious to the capping layer. Prior to bedding sand placement, the subgrade was inspected to document that it was a uniform, smooth surface free of rocks, litter, and organic debris. Before installation of the FML began, the Resident Project Representative, Contractor, and FML installer verified and that the surface area to be capped had been property prepared and was free from irregularities, protruding objects, or abrupt changes in grade. During placing and seaming on the FML, the subgrade was kept free of all standing water, and if it became wet or unstable, it was dried and re-compacted.

3.5 Imported Fill/Backfill Soils

This section provides a summary of the environmental and physical geotechnical property testing performed on the imported backfill and fill materials used as part of the closure construction.

Common fill was to be used to backfill the waste relocation areas to the proposed design grades and for other areas of the site that needed to be built up, such as the berms around stormwater basins and subbase of gravel access roads.

3.5.1 Borrow Source Testing

Sampling and analysis of fill/backfill and subbase materials was performed prior to site delivery to establish the moisture density curve and perform grain size analysis. Tests were performed for each type of material in accordance with the CAD and Major Modification summarized in **Table 3.2**.

Appendix F-1 contains the geotechnical and environmental laboratory reports received to demonstrate compliance with the CAD and Major Modification Approval.

3.5.2 Compaction Testing

In-situ density (compaction) tests were performed by an independent testing contractor between lifts and prior to placement capping materials. Compaction test results are included in **Appendix F-2**.

Table 3.2 Fill/Backfill Material Testing Requirements Summary

	Test	*Frequency*	*Number of Tests Required*[1]	*Number of Tests Conducted*	*Requirements*
Source Testing	Common Fill:				
	Sieve Analysis (to the #200 sieve)	1/ source or change in material type	4	4	20% passing #200 75% passing #40
	Atterberg Limits	1/ source or change in material type	4	4	Plasticity Index <30
	Chemical Testing (RCRA 8 Metals, PAH)	1/source	4	4	<MCP RCS-1
Conformance Testing	Sieve Analysis (to the #200 sieve)	1/1,500 CY	0[2]	0[2]	20% passing #200 75% passing #40
	Chemical Testing (RCRA 8 Metals, PAH)	1/1,500 CY	0[2]	0[2]	<MCP RCS-1
In-place Testing	Compaction (in-situ density)	Plateau – 1/10,000 s.f./lift Access Roads 1/100 l.f./lift Structures and Embankments – 1/2,500 s.f./lift Utilities 1/50 l.f./lift	160	503[3]	90% unimproved areas 92% common fill 95% Access Roads

Notes:
[1]See Appendix E for test results.
[2]Approximately 1,500 CY of each common fill source were used, therefore no conformance testing was required.
[3]Includes retests.

Twenty-seven compaction test results failed to meet requirements; however, after recompacting and retesting, all but three areas met requirements. Test locations 399, 448, 492 were below the required 92% compaction for common fill but had results of 91.2%, 90.7%, and 91.9% respectively. All three locations were on the berms of stormwater basins. Given the test results were very close to passing, they were allowed.

3.6 Coarse Sand Material

Coarse sand was used for the drainage and gas venting layers. The following conformance tests were required to ensure that the coarse sand material met project specifications:

- Grain size analysis (ASTM D421, D422, D2217, D1140) at a frequency of on sample per every 1,500 cubic yards of material.
- Permeability testing at a frequency of every 3,000 cubic yards to ensure that the material being used for the sand drainage layer met the design permeability coefficient of greater than or equal

to 1.2 x 10-2 cm/sec, and that the material being used for the gas venting layer met the design permeability coefficient of 1.0 x 10-3 cm/sec.

- To facilitate compaction testing, a moisture-density curve was developed at a frequency of one test every 3,000 cubic yards.
- Interface friction angle test on each source of coarse sand material to ensure that the friction angle between the FML and the sand is at least 25 degrees.

All borrow source, conformance, and in-place testing conducted on the bedding layer and drainage layer was in accordance with the CAD and Major Modification Approval and is summarized below.

One source (New Boston Pit) was used for the gas venting layer sand and drainage layer sand. Table 3.3 summarizes the geotechnical testing requirements and testing performed on the coarse sand material. **Appendix F-3** contains the geotechnical laboratory reports.

3.6.1 Borrow Source Testing

Borrow source testing was conducted to confirm acceptability of coarse sand materials. The source testing as required in the CAD and Major Modification Approval is provided in Table 3.3.

- Sieve Analysis (to the #200 sieve)
- Permeability
- Moisture Density
- Environmental Sampling (RCRA 8 Metals, PAHs)
- Direct Shear

All the gas venting layer and drainage layer coarse sand used met both the source testing requirements outlined in the CAD and Major Modification application except for the gradation requirements. The sand sieve analysis showed the sand was slightly finer than the design gradation for the sand drainage layer. The specific design gradation properties for the drainage sand are intended to prevent migration of fines from the topsoil layer into the sand layer, while still being permeable enough to allow water to efficiently drain from the topsoil layer. The gradation of the drainage sand was specified so the D15 of the sand is not more than 4 to 5 times the D85 of the topsoil. This criterion ensures the minimization of fines migrating between the topsoil and sand drainage layers. In addition, the sand gradation was designed so the D15 of the sand is at least 4 to 5 times the D15 of the topsoil. This criterion guarantees sufficient permeability to allow water to percolate through and prevent seepage forces from developing in the topsoil layer. Since the specific characteristics of the sand and topsoil were not known during design, assumed values for material coefficients were used to confirm the criteria were met. The calculations were performed based on the actual measured coefficients for the drainage sand and topsoil used at the site and it was determined that both design criteria were met, ensuring that the drainage sand will not clog and will be sufficiently permeable. In fact, the slightly finer sand will help to prevent the topsoil from mixing excessively and clogging.

Appendix F-3 contains the geotechnical laboratory reports for the coarse sand used for the bedding layer and drainage layer.

3.6.2 Conformance Testing

Conformance testing was performed on the gas venting layer and drainage layer material to confirm that the material consistently met the project specifications.

Conformance testing for the gas venting layer and drainage layer coarse sand material was conducted at the geotechnical and environmental testing frequency outlined in the CAD and Major Modification, and summarized in Table 3.3.

All conformance testing and results were in accordance with the CAD and Major Modification. Appendix F-3 contains the geotechnical laboratory reports for the coarse sand used for the bedding layer and drainage layer.

Table 3.3 Gas Venting Layer and Drainage Layer Coarse Sand Testing Requirements Summary

	Test	Frequency	Number of Tests Required[1]	Number of Tests Conducted	Requirements
Source Testing	Grain Size Analysis (to the #200 sieve)	1/ source or change in material type	1	1	3/4-in 100% No. 10 15-20% No. 200 < 5%
	Moisture Density	1/ source or change in material type	1	1	None
	Permeability	1/ source or change in material type	1	1	≥ 1.2 x 10-2 cm/sec (Gas venting layer) ≥ 1.0 x 10-3 cm/sec (Drainage layer)
	Direct Shear	1/ source	1	1	≥25 degrees peak
	Environmental Sampling (RCRA 8 Metals, PAH)	1/ source	1	1	<MCP RCS-1
Conformance Testing	Grain Size Analysis (to the #200 sieve)	1/1,500 cy	26	27	3/4-in 100 No. 10 15-20 No. 200 < 5
	Moisture Density	1/3,000 cy	18	18	None
	Permeability	1/3,000 cy	18	18	≥ 1.2 x 10-2 cm/sec (Gas venting layer) ≥ 1.0 x 10-3 cm/sec (Drainage layer)
	Environmental Sampling (RCRA 8 Metals, PAH)	1/5,000 cy	11	5	<MCP RCS-1
	Depth Confirmation	5/acre	113	113 Passing Test / 113 Total	≥6-inches (Gas vent layer) ≥12-inches (Drainage Layer)

Notes:
[1]Number of tests required based on volume of coarse sand installed – approximately 52,000 cubic yards.

3.6.3 In-Place Testing

Depth testing of each layer was completed by measure elevations at 113 consistent points throughout construction. Of the 113 points, all had 6 inches of gas vent sand and 12 inches of drainage sand or more.

Appendix I contains backup documentation of the confirmatory depth measurements of the topsoil conducted by Bates during construction.

3.7 LLDPE Geomembrane Capping Layer

The landfill closure design proposed two different types of cap, one a typical FML and another an alternative pavement cap discussed in detail in Section 3.8.

The FML capping layer installed is a 40-mil Linear Low-Density Polyethylene (LLDPE) geomembrane and was manufactured by Agru America (Agru). New England Liner Systems, Inc. (NELS) of Connecticut installed the LLDPE geomembrane for the project.

3.7.1 Conformance Testing of LLDPE Geomembrane

Agru America of Georgetown, South Carolina (Agru) conducted the manufacturing quality control program for the LLPDE geomembrane. Samples from each of the 72 rolls of geomembrane were analyzed by Agru. Testing was performed to verify conformance with project material specifications. The quality assurance tests performed by Agru on the HDPE included the following:

- Testing for carbon black content (ASTM D1603),
- Carbon black dispersion (ASTM D5596),
- Initial tear resistance (ASTM D1004),
- Tensile strength, Elongation, (ASTM D6693),
- Thickness (minimum and average)(ASTM D5994),
- Asperity height (ASTM D7466),
- Density (ASTM D1505),
- OIT (ASTM D8117),
- Melt Flow (ASTM D792),
- Carbon Content (ASTM D4218),
- Category 1 Dispersion (ASTM D5596), and
- Puncture Resistance (ASTM D4833).

The following tests were also completed on 10 of the rolls by GeoTesting Express of Acton, MA (GeoTesting) to meet the conformance testing requirements:

- Initial tear resistance (ASTM D1004),
- Density of Plastics (ASTM D1505)

- Carbon Black Content (ASTM D4218)
- Carbon Black Dispersion (ASTM D5596),
- Thickness (ASTM D5994)
- Tensile Strength and Elongation (ASTM D6693)
- Asperity Height (ASTM D7466)

All ten rolls tested to meet the required conformance testing frequency met the project specifications. The Certificates of Analysis are included in **Appendix G-1**.

3.7.2 Interface Friction Angle Testing

Direct shear testing was required at a frequency of one test per sand source and was conducted with the LLDPE geomembrane and sand used to construct the gas vent and drainage layers. The test was conducted by GeoTesting Express., in accordance with the ASTM D5321 methodology, performing the test at normal stresses of 1, 5, and 10 psi, with a displacement rate of 0.04 in/min. The shear analysis reported a peak frictions angle of 37.3° and a Post Peak Friction Angle of 35.2°. The specifications required a minimum friction angle of 25°. **Appendix G-2** contains copies of the laboratory results for the interface friction angle testing.

3.7.3 Geomembrane Installation Inspection

Prior to installation of any geomembrane, the subgrade (gas vent layer) was inspected by CDM Smith and NELS to insure a smooth, compacted surface free of stones, debris or any material potentially detrimental to the geomembrane.

Geomembrane panels were overlapped by a minimum of 4 inches prior to welding so that the edge of an adjacent panel was placed over the previously deployed panel. All areas of the geomembrane that were visibly damaged or blemished were repaired as required. NELS quality control personnel completed field documentation records following the panel placement, seaming, destructive and non-destructive testing, and repairs to the geomembrane. **Appendix G-3** contains NELS's panel layout plan and corresponding panel placement form, as-builts, and details. During installation, CDM Smith provided onsite inspection including inspection of the geomembrane panels including anchoring, alignment, overlap with adjacent panel(s), texture quality; thickness, identification (roll number and panel number), and panel length.

3.7.4 Geomembrane Trial Seams

Trial seams were performed on the geomembrane to verify the performance of the welding device and operator under the existing field conditions. Trial welds were required to meet the minimum strength requirements set forth in the specifications and summarized below in Table 3.4, prior to the start of any welding activities. Geomembrane trial welds were performed daily at the start-up and at four-hour (maximum) intervals thereafter. Any occurrence of a failing test would have required a repeat trial weld. A second failure would have required that two passing tests be performed by the operator prior to production welding. A subsequent failure would have resulted in that particular welding device being taken out of service for that given day of work and until the device was adjusted or repaired. Based on the results included in **Appendix G-4**, there were no failed trial welds.

Each test seam was sampled and field tested for bonded seam strength (shear) and peel adhesion strength (peel). The test results were recorded on a trial weld data log. The trial weld data log is included in Appendix G-4. Peel and shear testing is summarized in **Table 3.4** below.

Table 3.4 Trial Weld Seam Results Summary

Seam Property	Test Method	Minimum Requirements	Trial Seam Test Results Range
Shear Strength[1], ppi	ASTM D6392	60 ppi	79-84 ppi
Shear Strength[2], ppi	ASTM D6392	60 ppi	70-112 ppi
Peel Strength[1], ppi	ASTM D6392	50 ppi	69-98 ppi
Peel Strength[2], ppi	ASTM D6392	44 ppi	65-93 ppi

Notes:
[1]Hot Wedge Fusion Weld
[2]Extrusion Weld
ppi = pounds per inch

3.7.5 Geomembrane Field Seams

The geomembrane was welded using extrusion and double wedge fusion methods. All welding of the geomembrane was performed by appropriately qualified NELS employees. Double wedge fusion welding was the primary method used to weld geomembrane panel seams. Extrusion welding was used only for repairs and other special welding applications.

A tracking process was used during the field welding. Each seam was identified with a unique seam number. NELS personnel recorded the following data for each seam which was also verified by the geomembrane inspector:

- Panel identification numbers joined by the seams;
- Date the seam was made;
- Seam length; and
- Specific welding device.

Appendix G-5 contains copies of the panel seaming forms.

Inspection of the welding process consisted of visually observing the seaming operation to confirm that proper procedures were followed. Observations were made for the preparation of seams, the operating temperature of the welding devices, and the completed seams. The entire length of each seam was inspected for imperfections in the weld. Any imperfections found were marked and repaired according to the project specifications. Repair patches are shown on the panel layout drawing in Appendix G-3 and documented in the “Repair Report” table from NELS in Appendix G-5.

3.7.6 Non-Destructive Seam Testing

NELS was responsible for non-destructive testing of the total length of all geomembrane seams. This process involved the testing of the complete length of all seams with an air pressure device for double fusion welds and a vacuum box for extrusion welds.

Air pressure testing of the annular space created by double wedge fusion welds involved the following procedures:

- Sealing the air channel (between the inside and outside tracks of the fusion weld) at both ends of the seam;
- Inserting a needle with a pressure gauge attached into the air channel at one end of the double wedge fusion seam;
- Using an air pump, inflating the air channel to between 20 and 30 psi; and
- Observing the pressure gauge over a five-minute period. A pressure drop of more than 4 psi was indicative of a defective weld.

The vacuum box used on this project was a rigid wall box with a clear plexiglass top and an open bottom with a neoprene gasket. The gasket forms a seal between the box and the geomembrane. Vacuum box testing of extrusion welds or single fusion welds from which the top flap from the panel overlap had been removed involved the following procedure:

- Trimming excess sheet overlap;
- Applying a soapy water solution to the seam;
- Placing the vacuum box over the seam and compress;
- Applying a vacuum of approximately 3 psi to the inside of the box for a minimum of 10 seconds; and
- Observing the seam for air bubble formation, which is indicative of a discontinuity in the seam.

Appendix G-6 contains the results from non-destructive testing of geomembrane welds. All repairs were vacuum box tested for leaks by NELS personnel and witnessed by the CDM Smith onsite representative.

3.7.7 Destructive Seam Strength Testing

The destructive testing of geomembrane welds was performed in accordance with the project specifications. Seam samples were extracted and divided into three sections. One sample section was archived, one was tested in the field and the other was sent to the laboratory for testing. The laboratory and field welded sample sections were cut into ten one-inch wide specimens and were tested for bonded seam strength (shear) and peel adhesion strength (peel). The field sample was tested using a calibrated tensiometer.

A testing frequency of approximately one destructive test per 500 linear feet of seam plus allowances for re-testing for seam failures was performed. A CDM Smith representative was onsite during testing to ensure project frequencies were met. Details of the destructive sampling are presented below.

Destructive test samples were sent to GeoTesting Express of Acton, Massachusetts. One hundred one destructive tests samples (DT-1 through DT-101) were submitted for laboratory analysis for the landfill cap. Samples tested were cut into ten 1-inch-wide test specimens, five of each were tested for shear strength and peel strength of double wedge welds (peel of both weld tracks). Testing was run at a strain rate of 2-inches per minute for both peel and shear. The test specification for the 40-mil LLDPE

geomembrane required that all five bonded seam specimens had shear strengths greater than or equal to 60 pounds per inch (ppi) (width at yield), with failures occurring only as film tear bond (not in the seam). The peel samples were also required to meet a strength of at least 50 ppi (width at yield) for fusion hot wedge welds (44 ppi for extrusion welds). NELS personnel were responsible for obtaining the destructive samples and for patching the resultant hole in the geomembrane. Test results were reviewed as they were obtained by CDM Smith. All destructive test samples passed the required shear and peel strength testing. Specimen 4 for DT-81 did not pass the required shear elongation percentage, however this appears to be an anomalous test, and was allowed as the other specimen from DT-81 were well above the required shear elongation and the shear and peel strengths for specimen 4 met the requirements of the specifications.

Appendix G-7 contains copies of the in-field destructive test logs and certified laboratory reports for the quality assurance laboratory testing. Each destructive test location is indicated on the panel layout plan located in Appendix G-3. Appendix G-5 contains copies of the repair reports and Appendix G-7 contains copies of the in-field destructive test logs.

3.8 Geosynthetic Clay Liner

The south detention basin and the wet meadow adjacent to the former Ledge Road providing a flood storage function are located within the edge of waste. Since each of these by design cause water to temporarily pond on top of the cap, the capping system beneath the basin and wet meadow included a double-liner system consisting of a geosynthetic clay liner (GCL) installed beneath the FML. There were no viable alternative locations for the basin or wet meadow flood storage feature as waste extends to the boundary between the landfill property and residential property to the south and the wetland to the west. Removing waste from beneath either the proposed basin or flood storage wet meadow would not have been feasible due to the thickness of the waste and the fact that the waste extends into the water table. Any basin located to the east upgradient of the landfill would also have had to be lined to prevent infiltration, as the project objective is to reduce the groundwater table within the landfill. Similarly, the double-liner system under the south detention basin will also prevent recharge to groundwater to further the goal of lowering groundwater below landfilled waste.

3.8.1 Conformance Testing

Agru America of Georgetown, South Carolina conducted the manufacturing quality control program for the GCL. Samples of the liner from each 51 rolls were tested. The Manufacturer testing included:

- Tensile Strength (D6768),
- Peel Strength (ASTM D6496),
- Bentonite Mass and Moisture Content (ASTM D5993),
- Fluid Loss (ASTM D5891),
- Swell Index (ASTM D5890), and
- Index Flux and Hydraulic Conductivity (ASTM D5887).

Conformance testing for the GCL was completed by GeoTesting. The quality assurance tests performed by GeoTesting on the GCL included the following:

- Index Flux (ASTM D5887),
- Mass Per Unit Area (ASTM D5993), and
- Interface Shear Test (ASTM D6243).

The roll tested for conformance testing met the project specifications. The Certificates of Analysis are included in **Appendix H-1**.

3.8.2 Interface Shear Test

Direct shear testing was required at a frequency of one test per sand source and was conducted with the LLDPE geomembrane and sand used to construct the gas vent and drainage layers.

Interface Shear Tests were done of the GCL and the LLDPE liner; the GCL and the gas vent sand; and the GCL itself. All three tests were completed by GeoTesting in accordance with the ASTM D6243 methodology, performing the test at normal stresses of 1, 5, and 10 psi, with a displacement rate of 0.004 in/min. The shear analysis reported a peak frictions angle of 39.3°, 34.8°, and 41°. The specifications required a minimum friction angle of 25°. **Appendix H-2** contains copies of the laboratory results for the interface friction angle testing.

3.8.3 GCL Installation Inspection

Prior to installation of the GCL, the subgrade (gas vent layer) was inspected by CDM Smith and NELS to insure a smooth, compacted surface free of stones, debris or any material potentially detrimental to the geomembrane.

GCL panels were overlapped a minimum of 24 inches for end seams and 6 inches for side seams. The sems were cleaned and a bead of granular bentonite was placed between the overlapping panels.

All areas of the GCL that were visibly damaged or blemished were repaired as required. NELS quality control personnel completed field documentation records following the panel placement, seaming, destructive and non-destructive testing, and repairs to the geomembrane. **Appendix H-3** contains NELS's panel layout plan and corresponding panel placement form, as-builts, and details. During installation, CDM Smith provided onsite inspection including inspection of the GCL panels including: anchoring; alignment; overlap with adjacent panel(s); texture quality; thickness; identification (roll number and panel number); and panel length.

3.9 Topsoil Layer

Following the installation of the LLDPE FML and the 12-inch coarse sand drainage layer, the topsoil layer was placed in a single 8-inch lift. The topsoil layer consists of a mix of natural topsoil augmented as necessary with compost to meet the required organic content. Prior to installation, the Contractor analyzed topsoil for organic matter content and grain size at a frequency of one sample per 1,000 cubic yards of topsoil. These topsoil samples were also classified with the percentages of sand, silt and clay. One sample from each source of topsoil material was analyzed for organic matter, phosphorous, potassium, soluble salts, pH, and grain size distribution. Soil fertility recommendations were also provided by the testing laboratory. The topsoil used for this corrective action was tested to confirm that the soil was in conformance with the CAD and Major Modification as summarized below.

All borrow source, conformance testing and in-place testing conducted on the topsoil layer was in accordance with the CAD and Major Modification and is summarized below.

3.9.1 Borrow Source Testing

Prior to construction, topsoil was stripped from the former baseball fields and was tested for source testing. Three additional topsoil sources were. Source testing for for chemical analysis prior to the material being delivered to the site, while source testing for sieve analysis, organic content, pH, and fertility were tested on the final loam once the material was screened and amended with compost. Chemical sample results were required to be below RCS-1 standards. Source testing requirements for the topsoil are summarized in Table 3.5 and the results are provided in **Appendix I**.

Table 3.5 Topsoil Layer Testing Requirements Summary

	Test	Frequency	Number of Tests Required	Number of Tests Conducted	Requirements
Source Testing	Grain Size Analysis	1/source	1/source	4[1]	100% passing 2-inch
	Organic Content	1/source	1/source	4[1]	8-10%
	Nitrogen supplying capacity, phosphorus, potassium, soluble salts	1/source	1/source	4[1]	None
	Potassium, soluble salts	1/source	1/source	4[1]	None
	pH	1/source	1/source	4[1]	5.5-7.0 SU
	Chemical Analysis[2]	1/source	1/source	4	<MCP RCS-1
Conformance Testing	Grain Size Analysis	1/1,000 cy	23	23	USDA Sandy Loam
	Organic Content	1/1,000 cy	23	23	8-10%
In-Place Testing	Depth Confirmation	5/acre	113	113 Passing Test / 113 Total	≥8-inches

Notes:
[1]Tests were completed on finished material following screening and compost amendment.
[2]Chemical Analysis included: VOCs EPA Method 8260, SVOCs EPA Method 8270, EPA Priority Pollutant Metals Method 6000/7000 series, PCBs EPA Method 8080, Pesticides Method 8081, Herbicides EPA Method 8151.

3.9.2 Conformance Testing

Conformance testing was performed on the topsoil layer to confirm that the material was consistent in meeting the project specifications. Geotechnical and nutrient conformance testing requirements, including sieve analysis, organic content (1 sample per 1,000 cy for all testing) are summarized in Table

3.5. Conformance testing results showed that in general the loam met project requirements for organic content with some tests just above and just below the desired range while the sieve analysis showed the material was generally slightly coarser than the specified range for USDA sandy loam. Appendix I contains the laboratory testing reports.

3.9.3 In-Place Testing

Depth testing of each layer was completed by measure elevations at 113 consistent points throughout construction. Of the 113 points, all had 8 inches of topsoil or more.

Appendix I contains backup documentation of the confirmatory depth measurements of the topsoil conducted by Bates during construction.

3.10 Slope Stabilization and Erosion Control

Following the placement of the topsoil layer and the construction of drainage swales, the landfill slopes were seeded. Bonded fiber matrix was used in lieu of erosion control blankets on slopes greater than 4H:1V. Erosion control blankets were used in some areas of the site particularly vulnerable to erosion such as vegetated drainage swales. At this time, the vegetation on the capped areas of the landfill is well established and the drainage system is operating in accordance with the a CAD and Major Modification Approval.

A small disturbed area outside the limits of the cap in the area of the former Ledge Road was reseeded in September 2025 due to poor coverage; however, due to major drought throughout the summer of 2025 at the time of this writing turf has not been fully established in this area. The area will continue to be reseeded until turf is established.

3.11 Landfill Gas Management System

As described in the 2022 CAD Major Modification, The Ledge Road Landfill site is expected to produce relatively minor amounts of landfill gas due to the age of the landfilled waste. The proposed landfill gas management system is designed to passively vent gas to the atmosphere and control off-site subsurface landfill gas migration.

3.11.1 Passive Gas Venting System

Twenty-six passive gas vents were installed throughout the capped landfill area. These vents extend to a minimum of 10 feet above the bottom of landfilled waste or a minimum of 5 feet above the high groundwater table, whichever is shallow, to prevent the vents from being a pathway for landfill leachate to migrate to groundwater. The first five vents were installed spaced evenly across the landfill to determine the depth of waste and high groundwater elevation throughout the landfill prior to installing the remainder of the vents. The vents will serve to protect the integrity of the cap by allowing gases to vent to the atmosphere and prevent accumulation of gases beneath the cap.

Each vent has an approximate radius of influence of 100-feet; vents are spaced approximately 200-feet on-center. Since the depth of waste varies across the landfill, the first five vents installed were drilled 4-feet beyond the bottom of municipal waste to ensure virgin soil is reached, rather than daily cover material to confirm the depth of waste. These vents were backfilled with bentonite to 10 feet above the

bottom of waste or 4 feet above the high groundwater table, whichever was shallower. The depths of the remaining vents were then determined based on the bottom being conservatively either 11-feet above the estimated bottom of waste or 6-feet above the estimated high groundwater elevation, whichever was shallower. This is to prevent the vents from becoming a pathway landfill leachate to migrate into the native soil below.

A 6-inch perforated schedule 80 PVC pipe was centered vertically within each borehole and backfilled with uniform washed rounded stone. The sieve analysis for the washed stone is provided as **Appendix J**. Solid pipe was installed from approximately 24 inches below the gas venting layer. It is expected that build-up of gas pressure beneath the cap and sludge will be relieved by this perforated pipe, and that the solid pipe will not impede venting. The design assumes gas pressure build-up beneath the cap will be forced toward the washed stone and ultimately to the perforated pipe to be vented to the surface. Each vent extends a minimum of 8 feet above the landfill cap surface.

3.11.2 Passive Gas Venting Trench

Much of the landfill is bordered by wetland and/or vacant land. However, residential parcels abut the landfill to the south, and Town of Andover roads abut the landfill property to the northeast, east and south. Two passive gas trenches were installed:

- *South Edge*: A passive gas vent trench was installed between the landfill and the abutting southern properties, turning north at the eastern edge of the landfill and continuing along the former Ledge Road a short distance to be protective of residential properties located on Trinity Court. The gas vent trench was extended up the former Ledge Road in response to landfill gas exceedances encountered at landfill gas well LFG-9, located at the former Ledge Road intersection with Greenwood Road. This work was approved by MassDEP on May 22, 2025.
- *Northeast Edge*: A passive gas trench was installed at the northeastern corner and edge of the landfill. The northern trench begins in the northeast corner of the landfill and continues south along the eastern property line between the landfill and Chandler Road to be protective of the property boundary and utilities. Monitoring has indicated that concentrations of landfill gases in this corner of the landfill are elevated relative to other portions of the landfill, possibly due to the presence of impervious bituminous concrete pavement in the parking lot.

Horizontal gas collection trench locations are shown on Sheet C-23 through C-25 of the record drawings in Appendix B. The trenches were installed to bedrock or groundwater table, whichever was shallower.

The 1.5 inch washed stone submitted for use in the gas vent trench had slightly higher passing fractions for the 1 inch and 3/4 inch sieve analysis, but was allowed as the deviation will not have any affect on the performance of the material. All other materials submitted met the project specifications. The test results are provided in Appendix J.

4.0 Post-Closure Activities & Uses

4.1 Introduction

After the final cap has been installed, long-term monitoring and maintenance must be conducted at the capped landfill for a minimum 30-year post-closure period in accordance with the MassDEP Solid Waste Management Regulations (310 CMR 19.000) requirements. The regulations define the post-closure period as 30-years, but MassDEP may determine whether this period will be lengthened or shortened, depending on the potential threat the landfill poses to public health, safety or the environment.

During the post-closure period, the Town will inspect and maintain the integrity of the final capping system. Any settlement of the landfill will be repaired to prevent rainwater from ponding on the landfill cap and all drainage structures will be inspected to ensure proper working order.

4.2 Landfill Cap Maintenance

Maintenance activities following the landfill cap installation will include periodic inspection and care of the landfill cover and drainage features in accordance with applicable regulations and guidance.

4.2.1 Final Cover and Vegetation

Town personnel will inspect final cover on the sideslopes of the landfill regularly, including at least one inspection during the Spring following snowmelt. The cover material will be inspected for vegetative cover growth and erosion concerns. The Town will immediately repair any washouts or erosion problems. Routine final cap maintenance will include reseeding, as necessary, and mowing. With the exception of the southern detention basin and the restored wet meadow, which are to be mowed only once per year (see below), the grass cover should be mowed down to 4 to 5 inches twice per year (late June and early September) to promote growth of shallow rooted grass and to kill seedlet trees, shrubs, weeds, or other pioneer species. Bare, sparsely covered, and drought damaged areas will be reseeded (no later than early September) as soil moisture content returns to normal levels.

During the spring inspection, attention will be paid to any damage or deterioration that may have occurred during the winter. Localized subsidence or surface depressions (visual or as evidenced by the presence of puddles following a rainstorm) will require backfilling and regrading to reestablish final design grade and ensure proper drainage.

4.2.2 Gravel Access Roads

Access roads and pathways will be inspected for signs of deterioration, potholes, washouts, ponding/poorly drained areas and debris. During the spring inspection, attention will be paid to any damage or deterioration that may have occurred during the winter. Localized subsidence or surface depressions (visual or as evidenced by the presence of puddles following a rainstorm) will require backfilling and regrading to reestablish final design grade and ensure proper drainage. Any settlement will be repaired as soon as practical based on weather conditions.

Routine maintenance will include clearing, backfilling, regrading, and repaving. Provisions will be made for snow removal during the winter season. Any noted deficiencies will be given immediate attention.

4.2.3 Stormwater Control System Operations and Maintenance Plan

Drainage features including swales, drainage ditches, drainage outlets, and stormwater basins will be inspected by Town personnel a minimum of twice a year. Additionally, forebays will be inspected by Town personnel monthly. The inspections will include identification of areas of sediment accumulation and, if required, removing sediment to maintain the effectiveness of the drainage features.

Inspection of the stormwater control system will require a site walkover with a specific itinerary regarding required observations. Drainage swales will be checked for the presence of obstructions, erosion, ponding of water, and excessive siltation.

Routine maintenance will include clearing obstructions and removal of accumulated silt and debris. When accumulated debris and/or silt obstructs flow or compromises the storage volume of the basin, the sediment will be removed using mechanical means. Drainage swales may also need regrading or reconstruction to eliminate standing water. The southern detention basin and the wetland basin along Ledge Road, which are to be located on top of the landfill, are to be mowed once per year in early September.

A full stormwater control system operations and maintenance plan can be found in Appendix F of the Stormwater Management Report, located in Appendix M of this report, which includes requirements for inspection and maintenance of drainage structures including, but not limited to, catch basins and manholes in Greenwood Road, inline proprietary separators, and outfalls.

4.3 Landfill Gas Controls Maintenance

Each landfill gas monitoring well and landfill gas vent will be inspected and maintained during each landfill gas monitoring event to ensure that these systems are properly functioning. The inspection procedures are as follows:

- Permanent Gas Wells
  - Inspect the integrity of the permanent gas well protective casing and PVC riser
  - Inspect the permanent gas well sample port to ensure port is functioning properly and accessible for sampling
- Passive Gas Vents
  - Inspect the passive gas vents located across the top of the capped landfill for blockages, and to ensure the turbine ventilators can spin freely and function properly
  - Inspect the passive gas vents located along the southern and eastern edge of the landfill associated with the horizontal gas trenches for the same functionality as the passive gas vents located within the landfill

The MassDEP will be notified upon discovery of any damage to or destruction of a gas monitoring well or vent. In addition, the Town will submit in writing, within 30 days (or as required by the Solid Waste Management Regulations, a schedule for repair or replacement for approval by the MassDEP. Any repair or replacement work will be completed prior to the next scheduled sampling event.

4.4 Third Party Inspections

Biennial third party inspections of the site are performed by a qualified individual who is registered with the MassDEP as a third-party inspector as required per the February 14, 2014 Solid Waste Management Regulations update (310 CMR 19.018). These inspections occur on a biennial basis, with at least six months between consecutive inspections.

Regulatory requirements relating to third-party inspections include, but are not limited to:

- Inspections will be performed by an individual who meets the requirements, registration, and qualifications of a third-party inspector as defined in 310 CMR 19.018(5).
- Inspections shall be performed in accordance with the frequency and performance standards set forth in 310 CMR 19.018(6) and (7).
- Owner shall submit copies of all third-party inspection reports to the MassDEP in accordance with 310 CMR 19.018(8).
- Owners shall not conduct their own third-party inspections and shall not retain any of the following individuals for the tasks: a person with daily-on-site responsibilities, a person with financial interest in the facility, a relative (spouse, parent, child, or sibling) of the owner, a relative of any employee of the owner, or any employee of the owner, in accordance with 310 CMR 19.018 (4)(b).
- The third-party inspector shall be allowed full access to the facility and its records related to any solid waste activities. The owner shall in no way restrict, impede, or delay a third-party inspection.

At a minimum, the third-party inspection will address the following items:

- Observation of the landfill surface for erosion, cracks in the soil, vegetative growth (including the need for mowing), and localized settlement;
- Observation of the drainage and stormwater controls for effectiveness, erosion, siltation, settlement, clogging, and vegetative growth (if required); and
- Observation of monitoring and maintenance appurtenances.

After each inspection, a report will be submitted to MassDEP. The report will summarize the results of the inspectors' observations, note any deficiencies in the site conditions, recommend necessary repairs, and present a schedule for those repairs. Subsequent reports must address deficiencies noted in earlier inspections.

Inspections will be performed by an individual who meets the requirements, registration, and qualifications of a third-party inspector as defined in 310 CMR 19.018(5).

The Town reserves the right to petition the MassDEP to reduce the post-closure inspection frequency if it can be demonstrated that the reduction will be sufficient to protect human health, safety, and the environment.

4.5 Post-Closure Monitoring

After the final cap has been installed, monitoring and maintenance activities are required throughout the post-closure period. The Regulations define the post-closure period as 30-years, but the MassDEP may determine whether this period will be lengthened or shortened, depending on the potential threat to public health, safety, or the environment.

Environmental monitoring typically consists of testing groundwater, surface water and monitoring the landfill gas at the site to determine the effects the landfill is having on the surrounding environment. As documented in the November 2022 Major Modification, the environmental monitoring plan for the Ledge Road Landfill will consist of quarterly landfill gas monitoring, semi-annual groundwater sampling, semi-annual surface water sampling, wetland soil monitoring, and biennial landfill monitoring and maintenance inspections.

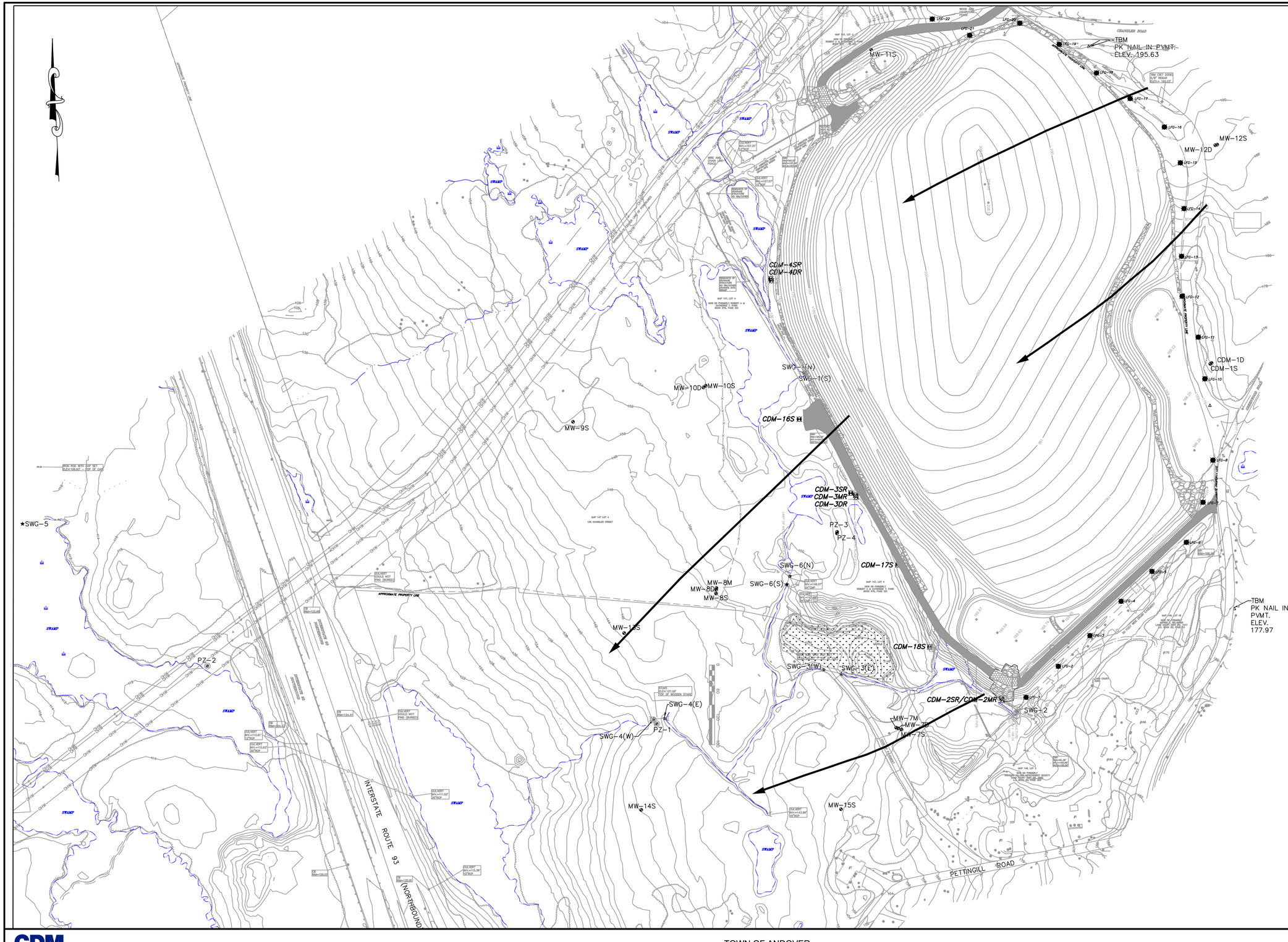
4.5.1 Groundwater and Surface Water

The post-closure environmental monitoring plan (EMP) approved with the 2022 CAD Major Modification includes semi-annual monitoring consisting of groundwater gauging at 32 groundwater monitoring wells/piezometers and groundwater sampling at 27 of those 32 wells, surface water sampling at nine surface water sampling locations, and surface water gauging at five surface water gauging locations, as presented in **Table 4.1**. The monitoring well and surface water sampling locations are illustrated on **Figure 4.1**. Details of all existing monitoring wells and information regarding whether the wells are to be protected, replaced, or permanently abandoned are provided in Table 4.1. Groundwater and surface water parameters to be analyzed are also identified in Table 4.1.

All of the wells located along the western edge of the landfill (CDM-2S/M/D, CDM-3S/M/D, CDM-4S/M/D, MW-5S, OW-1, OW-2, and TW-1) were decommissioned or destroyed during clearing to complete construction of the Corrective Action.

As proposed in the CAD Major Modification, CDM-2SR, CDM-2MR, CDM-3SR, CDM-3MR, CDM-3DR, CDM-4SR, CDM-4DR were installed replacing CDM-2S/M, CDM-3S/M/D, and CDM-4S/D, which will provide adequate spatial and depth coverage. To supplement this series of wells, CDM-16S, CDM-17S, and CDM-18S were also installed and added to EMP for gauging and select water quality parameters pertinent to assessing the effectiveness of the Corrective Action (DO, ORP, DOC, arsenic, iron). Monitoring well logs are provided in **Appendix K**. Although the original CAD suggested that MW-9S would be decommissioned, it will be retained for gauging. The original CAD also suggested removing surface water sampling locations SW-4 and SW-24; however, based on comments from MassDEP, these locations will be retained and monitored for 1,4-dioxane since concentrations of 1,4-dioxane have been detected in surface water samples at both of these locations exceeding the ORS guidance value for 1,4-dioxane (0.3 ug/l).

Monitoring well MW-6S was removed for the construction of the wetland replication area and will be replaced in 2026. Otherwise, no changes are proposed to the EMP.



LEGEND

★SWG	SURFACE WATER GAUGE STATION
MW/CDM	EXISTING MONITORING WELL
MW/CDM	MONITORING WELL TO BE ABANDONED
	OBSERVATION WELL TO BE ABANDONED
PZ	EXISTING PIEZOMETER
	6" TEST WELL TO BE ABANDONED
CDM	MONITORING WELL INSTALLED DURING LANDFILL CLOSURE CONSTRUCTION NOVEMBER 2024–JANUARY 2025
△TBM	TEMPORARY BENCHMARK
170	TOPOGRAPHIC CONTOURS (2' CONTOUR INTERVAL)
MW-13S	EXISTING MONITORING WELL
→	GROUNDWATER FLOW DIRECTION

EXISTING CONDITIONS/SURVEY NOTES:

1. EXISTING CONDITIONS INFORMATION TAKEN FROM PLAN ENTITLED "TOPOGRAPHIC SURVEY LEDGE ROAD ANDOVER, MASSACHUSETTS" BY WSP–SELLS DATED MARCH 20, 2009.
2. COORDINATES ARE BASED ON MASSACHUSETTS STATE PLANE COORDINATE SYSTEM (NAD 83). VERTICAL ELEVATIONS ARE BASED ON 1988 NGVD ADJUSTED TO 1929 NGVD.
3. SURVEY FOR MONITORING WELL LOCATIONS PERFORMED BY CDW CONSULTANTS, INC. ON MARCH 27–28, 2013, AND SEPTEMBER 23, 2013.
4. ALL WATER ELEVATIONS AND GROUNDWATER CONTOUR ELEVATIONS IN FEET–MEAN SEA LEVEL.

CDM Smith
75 State Street, Suite 701
Boston, MA 02109
Tel: (617) 452-6000

TOWN OF ANDOVER
LEDGE ROAD LANDFILL
CLOSURE PROJECT

FIGURE 4.1
GROUNDWATER AND SURFACE WATER POST-CLOSURE MONITORING LOCATIONS
OCTOBER 2025

TABLE 4.1
POST-CLOSURE MONITORING PLAN
SEMI-ANNUAL GROUNDWATER AND SURFACE WATER MONITORING
LEDGE ROAD LANDFILL, ANDOVER, MASSACHUSETTS

Existing Monitoring Well ID	*Status* [1]	*Well Type*	Well Construction		Existing EMP Locations [2]	*Field Parameters* [3]	*Dissolved Metals* [4]	*Indicator Parameters* [5]	*VOCs* [6]	*1,4 Dioxane* [7]	*Dissolved Arsenic*	*Dissolved Organic Carbon* [8]	*Water Level*	*Reason for Inclusion EMP/Arsenic Monitoring OR Removal from EMP*
			Screened Interval (feet-bgs)	Strata										
Groundwater Monitoring Wells - Upgradient/Crossgradient of the Landfill														
CDM-1S		Shallow Overburden	3-13	CM SAND + SILT	Yes								X	Former Upgradient Water Quality Well - MW-12S serves this function, maintain for water levels
CDM-1D		Deep Overburden	53-63	F. SAND + SILT	Yes								X	Former Upgradient Water Quality Well - MW-12D serves this function, maintain for water levels
MW-11S	Replace: CDM-11SR	Shallow Overburden	1.5-6.5 (Existing) 14-24 (Replacement)	CMF SAND									X	Primarily Upgradient - Water Level Only (Replace Due to Storm Basin Access Road Construction)
MW-12S		Shallow Overburden	10-20	CM SAND, some cf gravel		X	X	X	X	X	*		X	Shallow Overburden Upgradient Well
MW-12D		Shallow Overburden	39-49	GRANITE		X	X	X	X	X	*		X	Bedrock Upgradient Well
Groundwater Monitoring Wells - Immediately Downgradient of Landfill														
CDM-2S	Replace: CDM-2SR	Shallow Overburden	3-13	CMF SAND, some silt	Yes	X	X	X	X	X	*	X	X	Monitor for Improved Groundwater Quality Post-Cap (Replace Due to Cap Construction)
MW-2M	Replace: MW-2MR	Middle Overburden	22-32	F. SAND, some silt		X					X		X	Monitor for Post-Cap Arsenic Concentrations
CDM-2D	Decomission	Deep Overburden	53-63	F. SAND + SILT	Yes									Decommission Due To Cap Construction- Groundwater Quality Monitoring in Deeper Overburden Achieved with MW-2M
CDM-3S	Replace: CDM-3SR	Shallow Overburden	3-13	GRAVEL + CM SAND	Yes	X	X	X	X	X	*		X	Monitor for Improved Groundwater Quality Post-Cap (Replace Due to Cap Construction)
MW-3M	Replace: MW-3MR	Middle Overburden	40-50 (Existing) 15-25 (Replacement)	F. SAND, some silt		X	X	X	X	X	X	X	X	Monitor for Improved Groundwater Quality Post-Cap (Similar Screen Interval to TW-1). Install next to CDM-3SR
CDM-3D	Replace: CDM-3DR	Bedrock	85-95	GRANITE	Yes	X					X		X	Bedrock Well - Monitor for Post-Cap Reduction of Arsenic in Bedrock
CDM-4S	Replace: CDM-4SR	Shallow Overburden	8-18	GRAVEL + CM SAND	Yes	X	X	X	X	X	*	X	X	Monitor for Improved Conditions Post-Cap (Replace Due to Cap Construction)
MW-4M	Decomission	Middle Overburden	30-40	F. SAND										Decommission - No Previous Detection of Arsenic
CDM-4D	Replace: CDM-4DR	Deep Overburden	58-68	F. SAND + SILT	Yes	X					X		X	Monitor for Reduction of Arsenic
MW-5S	Decomission	Shallow Overburden	10-20	CMF SAND										Decommission Due to Cap Construction - Well Installed in Waste
TW-1 (6")	Decomission	Middle Overburden	12-27	CF GRAVEL + CMF SAND										Decommission Due to Cap Construction - No Need for 6-Inch Well (OW-2R serves this function)
OW-1	Decomission	Middle Overburden	20-30	F. SAND										Decommission Due to Cap Construction - (OW-2R serves this function)
OW-2	Decomission	Shallow-Mid Overburden	11-21	CF GRAVEL + CMF SAND										Decommission Due to Cap Construction - Groundwater Quality Monitoring in Middle Overburden Achieved with CDM-3-MR Replacement Well
PZ-3		Middle Overburden	29-39	F. SAND + SILT							X		X	Former Pumping Test Observation Well - Monitor for Improved Groundwater Quality Post-Cap
PZ-4		Shallow-Mid Overburden	15-25	F. SAND	-						X	X	X	Former Pumping Test Observation Well - Monitor for Improved Groundwater Quality Post-Cap
Groundwater Monitoring Wells - Downgradient of Landfill														
MW-6S		Shallow Overburden	3-13	CMF SAND	Yes	X	X	X	X	X	*		X	Monitor for Improved Groundwater Quality Post-Cap
MW-7S		Shallow Overburden	2-12	GRAVEL + CMF SAND		X	-	-			X		X	Monitor for Arsenic concentrations, to confirm clean edge (<10 ug/L)
MW-7M		Deep Overburden	52-62	F. SAND + SILT		X					X		X	Monitor for Reduction of Arsenic
MW-7D		Bedrock	90-100	GRANITE		X					X		X	Monitor for Arsenic
MW-8S		Shallow Overburden	2-12	GRAVEL + CMF SAND		X	X	X	X	X	*	X	X	Monitor for Improved Conditions Post-Cap
MW-8M		Middle Overburden	20-30	F. SAND + SILT		X					X		X	Monitor for Reduction of Arsenic
MW-8D		Bedrock	85-95	GRANITE		X					X		X	Monitor for Arsenic
MW-9S		Shallow Overburden	1-11	CMF SAND, some wood									X	Water Level Only - No Previous Detection of Arsenic
MW-10S		Shallow Overburden	3-13	GRAVEL + CMF SAND		X					X		X	Monitor for Arsenic concentrations, to confirm clean edge (<10 ug/L)
MW-10D		Bedrock	80-90	GRANITE		X					X		X	Monitor for Arsenic
MW-13S		Shallow Overburden	3-13	FINE SAND, some cm sand		X					X		X	Monitor for Arsenic concentrations, to confirm clean edge (<10 ug/L)
MW-14S		Shallow Overburden	7-17	CMF SAND, little gravel		X					X		X	Monitor for Arsenic concentrations, to confirm clean edge (<10 ug/L)
MW-15S		Shallow Overburden	9-19	CF GRAVEL + CMF SAND									X	Water Level Only - No Previous Detection of Arsenic
MW-16S	New Well	Shallow Overburden	13-Mar	CMF SAND, little gravel		X					X		X	Monitor for Arsenic concentrations, to confirm clean edge (<10 ug/L)
MW-17S	New Well	Shallow Overburden	13-Mar	CMF SAND, little gravel		X					X		X	Monitor for Arsenic concentrations, to confirm clean edge (<10 ug/L)
MW-18S	New Well	Shallow Overburden	13-Mar	CMF SAND, little gravel		X					X		X	Monitor for Arsenic concentrations, to confirm clean edge (<10 ug/L)
PZ-1	Replace: PZ-1R	Shallow Overburden	4-8 (Existing) 5-10 (Replacement)	MF SAND + GRAVEL	Yes	X	X	X	X	X	*	X	X	Monitor for Improved Groundwater Quality With Cap
PZ-2		Shallow Overburden	5-10	CMF SAND + SILT	Yes	X					X		X	Downgradient location for monitoirng arsenic
Surface Water Sampling Stations														
SW-1		-	-	-	Yes	X	X	X	X	X	*			Upgradient/Crossgradient Surface Water
SW-2	Relocate: SW-2R	-	-	-	Yes	X	X	X	X	X	*	X		Relocate from Outfall of Underdrain System (Decomission) to Downgradient SW Body - Monitor For Improved Conditions Post-Cap
SW-3	Relocate: SW-3R	-	-	-	Yes	X			X	X	X			Relocate from Outfall of Greenwood St Storm Drain System to Downgradient SW Body - Monitor For Improved Conditions Post-Cap
SW-4	Eliminate	-	-	-	Yes	X				X				Concentrations of 1,4-dioxane have been detected in surface water samples from this location exceeding the ORS guidance value
SW-5	Relocate: SW-5R	-	-	-	Yes	X	X	X	X	X	*	X		Relocate upgradient; Monitor for Improved Conditions Post-Cap - Downgradient
SW-8		-	-	-	Yes	X	X	X	X	X	*	X		Monitor for Improved Conditions Post-Cap - Downgradient
SW-24	Eliminate	-	-	-	Yes	X				X				Concentrations of 1,4-dioxane have been detected in surface water samples from this location exceeding the ORS guidance value
SW-203		-	-	-	Yes	X	-			X	X			Downgradient Un-Named Stream Before Entering Fish Brook - Monitor for Arsesnic and Improved Conditions Post-Cap
SW-206		-	-	-	Yes	X				X	X			Downgradient West of I-93 (Fish Brook) - Monitor for Arsenic
WTP	Eliminate	-	-	-	Yes									Eliminate Raw Water Influent at the Water Treatment Plant - No Impacts from Fish Brook into Haggets Pond
Surface Water Gauging Stations														
SWG-1	Eliminate	-	-	-										Underdrain Headwall to Be Removed During Cap Construction
SWG-2	Relocate: SWG-2R	-	-	-									X	Greenwood Street Storm Drain Headwall to be Extended, Add as New Surface Water Gauging Station
SWG-3		-	-	-									X	For water table contour development
SWG-4		-	-	-									X	For water table contour development
SWG-5		-	-	-									X	For water table contour development
SWG-6		-	-	-									X	For water table contour development

Notes:

[1] Status: Identifies well's status during post-closure use monitoring; remains, replacement, decommission

[2] EMP: Identifies which locations are in the existing Environmental Monitoring Plan (EMP), CDM Smith 2008

[3] Field Parameters: pH, temperature, specific conductance, dissolved oxygen, oxidation reduction potential (ORP)

[4] Dissolved Metals: arsenic, barium, cadmium, calcium, chromium, copper, iron, lead, manganese, mercury, selenium, silver, sodium, zinc

[5] Indicator Parameters: alkalinity, chemical oxygen demand, chloride, total cyanide, nitrate-nitrogen, total dissolved solids, hardness, sulfate

[6] VOCs: volatile organic compounds by EPA Method 8260

[7] 1,4 Dioxane: 1,4 dioxane by SVOC Method 8270 SIM D

[8] Dissolved organic carbon (DOC) to be sampled on an annual basis. DOC is an indicator of diminishing leachate plume, and the transition from reduced to oxygenated aquifer conditions. With reducing DOC, arsenic concentrations expected to decrease.

Legend:

Gray shaded monitoring locations to be removed from the sampling program

* : For these samples dissolved arsenic is included in the full suite of dissolved metals analysis

R = Represents replacement well as original to be destoryed during construction

QA/QC Requirements:

One duplicate water sample (DUP-1) will be collected each round, for all parameters

Trip blanks will be collected for VOCs. One trip blank included in each shipment of samples to the laboratory

During each semi-annual groundwater sampling event, a comprehensive round of groundwater elevation measurements will be conducted using each accessible well location in the monitoring network as well as staff gauges. A groundwater elevation contours plan, showing groundwater flow direction, will be prepared for each sampling event.

All sampling and analysis will be conducted in accordance with standard operating procedures. Samples will be collected in laboratory-provided glassware, preserved and placed on ice, shipped under chain of custody, and submitted to a Massachusetts certified laboratory. Laboratory reporting limits must meet or be below the Maximum Contaminant Level (MCL) or applicable standards for each analyte. Results will be submitted to MassDEP within 60 days after sampling or as specified in the permit. If concentrations exceed applicable state and federal standards, MassDEP must be notified within 14 days of the finding, and follow-up sampling may be required.

4.5.2 Landfill Gas Monitoring

The Post-closure landfill gas monitoring will be conducted in compliance with 310 CMR 19.132 and 310 CMR 19.142. Permanent landfill gas wells were installed as shown on Sheets C-23 though C-25 of the Record Drawings in Appendix B. A total of 22 landfill gas wells were installed along the southern and eastern property line, continuing around the landfill to the northeastern corner. Landfill gas well logs are provided as **Appendix L.**

As proposed in the 2022 CAD Major Modification, landfill gas monitoring will include measuring the 22 landfill gas wells for the following:

- Concentrations of methane (CH4), carbon dioxide (CO2), and oxygen (O2) using a Landtec GEM 5000 Gas Analyzer or equivalent.
- Landfill gas concentrations as a percentage of the Lower Explosive Limit (LEL).
- Hydrogen Sulfide (H2S) concentrations using a tritector.
- Organic vapor concentrations using photoionization detector.

Landfill Gas Well LFG-8 was removed during the installation of the gas vent trench extension. The location is currently monitored with a soil gas probe in its place and will be replaced in 2026.

Monitoring will be conducted in accordance with MassDEP approved methods. Results will be reported to MassDEP within 60 days of each sampling event. If the results indicate that the concentration of explosive gases at any location exceeds 25 percent of the LEL, MassDEP will be notified within 24 hours.

Monitoring will be conducted on a quarterly basis for the first year following cap installation. The results of the quarterly monitoring will be reviewed after the first year and the need for additional monitoring and/or response actions (e.g. signage, access restrictions) will be evaluated.

4.5.3 Wetland Soils

The post-closure wetland soil monitoring program will evaluate the potential re-accumulation of iron and arsenic in downgradient wetland soils. Groundwater discharges to the down-gradient wetlands, where arsenic and iron have historically co-precipitated within the soil. The monitoring program will include:

- Shallow wetland soil sampling and provision for the re-computation of the site exposure point concentrations relative to arsenic to confirm that the site average remains below the 900 mg/kg risk based standard;

Wetland soil samples will be collected annually from each of the seven wetland soil hot spot areas using a hand trowel or hand auger. The samples will target the middle of each area as they will be first to rebound following excavation. The number of samples in each area will is shown below in **Table 4.2**:

Table 4.2 Summary Wetland Soil Sampling Frequency and Analysis

Wetland Soil Removal Area	Proposed Analyses	Number of Samples Proposed (0-2 in)	Number of Samples Proposed (6-8 in)
WRA-1	Total Arsenic, Total Solids	1	0
WRA-2	Total Arsenic, Total solids	2	0
WRA-3	Total Arsenic, Total solids	3	1
WRA-4	Total Arsenic, Total solids	2	0
WRA-5	Total Arsenic, Total solids	7	2
WRA-6	Total Arsenic, Total solids	6	1
WRA-7	Total Arsenic, Total solids	2	0

Exact sample locations will be field located during the first event and marked using stakes. The number of locations in each area represents 50% of the bottom samples collected in each area during hot spot excavation rounded up in instances that an odd number of samples were collected. Future sampling events will be collected at the same locations to monitor trends over time. Approximate proposed locations are shown on **Figure 4.2**. Samples will be collected from 0-2 inches below ground surface at all locations, and at some locations, a slightly deeper sample from 6-8 inches below ground surface will also be collected. All samples will be collected in laboratory-provided glassware, preserved and placed on ice, shipped under chain of custody, and submitted to a Massachusetts certified laboratory.

Results will be submitted to MassDEP within 60 days after sampling or as specified in the permit. Wetland soil sampling data, groundwater quality monitoring, and groundwater level monitoring will be analyzed following 5 years of monitoring to determine the landfill cap's effectiveness in lowering the water table and reducing arsenic concentrations precipitating in the downgradient wetlands. It is possible that some initial rebound may be observed, but the need for further excavation of wetland soils or other efforts will be evaluated after the entire 5-year period has passed.

4.6 Post Closure Uses

No post-closure uses are proposed at this time.

XREFs: [Wetland Survey Dwg - WSP 9.2.15, Final_Grading-Working, Full Site Survey Revised 5.11.16, C001GRPL, 16365-CS-BN, CDMS_2436, 20250827 andover sheet 3.liner, 20250827 ANDOVER. SHEET 1. CULVERT, 20250827 andover. sheet 2.subgrade, 20250915 ANDOVER. SHEET 4.FINAL GRADING] Images: []
Last saved by: YOUNGDK Time: 10/17/2025 2:36:59 PM
pw:\\cdmsmith-az02-pw.bentley.com:pw_p11\0235\113811\04 Design Services NM_100%\02 Civil\10 CADD\2025 RECORD DRAWINGS\C005WRLPRD.dwg
©2025 CDM SMITH ALL RIGHTS RESERVED
REUSE OF DOCUMENTS: THESE DOCUMENTS AND DESIGNS PROVIDED BY PROFESSIONAL SERVICE, INCORPORATED HEREIN, ARE THE PROPERTY OF CDM SMITH AND ARE NOT TO BE USED, IN WHOLE OR PART, FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF CDM SMITH.

WETLAND SOIL REMOVAL AREA #1 – TEMPORARY ALTERATION OF APPROX. 200 SF OF WATERS OF THE U.S.

WETLAND SOIL REMOVAL AREA #2 – TEMPORARY ALTERATION OF APPROX. 900 SF OF WATERS OF THE U.S.

WETLAND SOIL REMOVAL AREA #3 TEMPORARY ALTERATION OF APPROX. 3,800 SF OF WATERS OF THE U.S.

WETLAND SOIL REMOVAL AREA #4 – TEMPORARY ALTERATION OF APPROX. 1,000 SF OF WATERS OF THE U.S.

WETLAND SOIL REMOVAL AREA #5 – TEMPORARY ALTERATION OF APPROX. 13,600 SF OF WATERS OF THE U.S.

WETLAND SOIL REMOVAL AREA #6 – TEMPORARY ALTERATION OF APPROX. 3,350 SF OF WATERS OF THE U.S.

WETLAND SOIL REMOVAL AREA #7 – TEMPORARY ALTERATION OF APPROX. 2,350 SF OF WATERS OF THE U.S. TEMPORARY ALTERATION TO 110 LF BANK

SHEET MATCH LINE
SHEET MATCH LINE

SHEET MATCH LINE
SHEET MATCH LINE

100 FT BUFFER TO VERNAL POOL
75 FT NO BUILD
50 FT NO DISTURB

100 FT BUFFER TO VERNAL POOL
75 FT NO BUILD

50 FT NO DISTURB
75 FT NO BUILD
100 FT BUFFER

100 FT BUFFER
75 FT NO BUILD
50 FT NO DISTURB

BENCHMARK: PBM-5
RAIL ROAD SPIKE SET IN BASE OF 18" PINE TREE.
ELEVATION = 154.32'

PROPOSED LEGEND

- WASTE RELOCATION AREA
- TEMPORARY WETLAND IMPACT AREAS
- PERMANENT WETLAND IMPACT AREAS
- ISOLATED WETLANDS
- PERMANENT ISOLATED WETLAND IMPACT AREAS
- EDGE OF LLDPE CAP
- APPROX. EDGE OF WASTE
- WETLAND SOIL SAMPLE (0-2 INCHES BGS)
- WETLAND SOIL SAMPLE (0-2 AND 6-8 INCHES BGS)

1" = 60'
30 0 60

REV. NO.	DATE	DRWN	CHKD	REMARKS
5	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
4	3/2023	JRH	NEJ	UPDATED FOR BIDDING
3	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE / DPW MATERIALS HANDLING AREA
2	4/2017	JRH	NEJ	REVISED TO RESPOND TO COMMENTS FROM THE U.S. ARMY CORPS. OF ENGINEERS
1	3/2017	NEJ	MHL	REVISED TO RESPOND TO CONSERVATION COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY: N. JONES
DRAWN BY: N. JONES
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

CDM Smith
75 State Street, Suite 701
Boston, MA 02109
Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

WETLAND SOIL SAMPLING PLAN
FIGURE 4.2

PROJECT NO. 0235-113811
FILE NAME: C005WRLPRD.DWG
SHEET NO.

4.7 Notice of Landfill Operations

The Town of Andover is in the process of preparing and recording the Notice of Landfill Operation, pursuant to 310 CMR 19.141. The Notice of Landfill Operation will be recorded in the Essex County Registry of Deeds in accordance with M.G.L. C. 111, sec 150A. A copy of the recorded Notice of Landfill Operation will be provided to MassDEP when available.

5.0 Certification

I, Nathan E. Jones, attest under the pains and penalties of perjury that:

(a) I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification statement;

(b) based on my inquiry of those persons responsible for obtaining the information, the information contained in this submittal is, to the best of my knowledge, true, accurate, and complete;

(c) I am fully authorized to bind the entity required to submit these documents and to make this attestation on behalf of such entity; and

(d) I am aware that there are significant penalties, including, but not limited to, possible administrative and civil penalties for submitting false, inaccurate, or incomplete information and possible fines and imprisonment for knowingly submitting false, inaccurate, or incomplete information.

Nathan E. Jones, P.E.

Massachusetts P.E. No. 47566

Appendix A Regulatory Approvals and Correspondance

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Northeast Regional Office • 205B Lowell Street, Wilmington MA 01887 • 978-694-3200

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

RICHARD K. SULLIVAN JR.
Secretary

KENNETH L. KIMMELL
Commissioner

MAY 09 2012

Christopher Cronin, Acting Director
Town of Andover
Department of Public Works
397 Lowell Street
Andover, MA 01810

RE: ANDOVER – Solid Waste/COR
Ledge Road
Ledge Road Landfill
FMF # 269388
Corrective Actions Alternatives Analysis
Conditional Approval
Transmittal # X234306

Dear Mr. Cronin:

The Massachusetts Department of Environmental Protection, Northeast Regional Office, Bureau of Waste Prevention, Solid Waste Section (the "MassDEP") has reviewed of the Town of Andover's Corrective Actions Alternatives Analysis (CAAA) for the Ledge Road Landfill, Ledge Road, Andover, Massachusetts. The CAAA was prepared on behalf of the Town by CDM Smith Inc., Cambridge, Massachusetts (CDMSmith).

Between circa 1946 and 1972 the Town of Andover (the "Town") operated a landfill for the disposal of municipal solid wastes (MSW) off Ledge Road in Andover, Massachusetts (the Ledge Road Landfill, the "landfill"). Following the termination of disposal of MSW, the landfill continued operating for the disposal of leaves, brush and grass clippings (i.e. yard waste). The waste materials were subsequently covered by various types of soil, however, a cap, compliant with the requirements of the Solid Waste Management Regulations[1], has not been installed.

Pursuant to 310 CMR 19.140(3), et al, the Town conducted an assessment of the landfill and identified that Arsenic (As) and Iron (Fe) are being discharged from the landfill to the abutting wetlands. The wetlands are identified as being tributary to Fish Brook, a part of the Towns public

[1] 310 CMR 19.15, et al, as effective April 21, 1971 through June 30, 1990 or 310 CMR 19.112, et al, as amended, as effective July 1, 1990 to date.

water supply. The discharge of Arsenic and Iron is anticipated to continue, thus requiring action by the Town to remediate and protect the wetland.

The Town contracted CDMSmith to conduct an analysis potential corrective actions, a CAAA, to determine the most feasible actions to implement a final closure of the landfill compliant with the Solid Waste Management Regulations and to remediate and protect the wetland. CDMSmith has identified two (2) potential alternatives, identified as Alternative 4 (ALT-4) and Alternative 5 (ALT-5) in the CAAA.

ALT-5 proposes to install a ground water extraction trench along the southwesterly side of the landfill. Water collected in the trench would be discharged to a treatment system consisting of an aerated pond and a manmade wetland to remove the Arsenic and Iron prior to discharging the water to the existing natural wetlands. Under ALT-5 the landfill would be covered by a thirty-six (36) inch thick soil cap to cover the wastes and reduce the infiltration of storm water. ALT-4 is similar to ALT-5 except for the addition of a flexible membrane[2] in the cap to further reduce infiltration, and the cap is reduced to a total thickness of twenty-six (26) inches.

ALT-5 includes only a six (6) inch layer of topsoil with no underlying drainage soil layer. ALT-4 would include an eight (8) inch layer of topsoil with an underlying twelve (12) inch drainage (sand) layer.

CDMSmith has recommended ALT-5 as the selected alternative for closure of the landfill.

CDMSmith states that the selected alternative "will require Final Cover Waiver as specified in 310 CMR 19.114". The landfill was used for the disposal of municipal solid waste (MSW). Therefore, as stipulated at 310 CMR 19.114(1), the landfill is not eligible for a "waiver" pursuant to this section. MassDEP may, however, entertain a proposal for approval of an alternate final cover design pursuant to 310 CMR 19.113 "*Alternate Landfill Final Cover System Design*", and 310 CMR 19.105 "*Equivalency Review Standards*" or 310 CMR 19.150 "*Landfill Assessment Requirements*".

310 CMR 19.113 requires that the "final cover material" of a landfill which received waste after October 9, 1991 shall have a maximum hydraulic conductivity (permeability) of no greater than $1.0x10^{-5}$ cm/sec. While the disposal of MSW ceased in 1972, the site continued afterward to be used for the disposal of waste (yard waste). The CAAA does not identify when disposal of waste by landfilling at the site was terminated. The selected alternative (ALT-5) allows for soil with a permeability of $1.0x10^{-4}$ cm/sec, or greater, to be used.

MassDEP approves the CAAA subject to the Town's compliance with the following conditions imposed pursuant to 310 CMR 19.150(2)(a).

1. Unless it is demonstrated that all waste disposal by landfilling, including yard wastes, were terminated prior to October 9, 1991, the final cap for the landfill shall include a

[2] An "FML", such as High Density Poly-Ethylene (HDPE).

layer to reduce infiltration into the waste with a hydraulic conductivity (permeability) of not greater than $1.0x10^{-5}$ cm/sec.

2. The final cover shall, pursuant to 310 CMR 19.112(7&9), include vegetative support providing not less than eight (8) inches of topsoil [twelve (12) inches if the organic content of the topsoil is less than eight (8) percent], plus lateral drainage of water permeating the topsoil, unless approved otherwise pursuant to 310 CMR 19.113.

3. The application for approval of the Corrective Action Design ("CAD") shall, pursuant to 310 CMR 19.113, demonstrate the selected alternative will adequately protect public health, safety and the environment pursuant to 310 CMR 19.105.

NOTICE OF RIGHT TO APPEAL

The Town of Andover (the "Town") is hereby notified that it may within twenty-one (21) days file a request that this decision be deemed a provisional decision under 310 CMR 19.037(4)(b), by submitting a written statement of the basis on which the Town believes it is aggrieved, together with any supporting materials. Upon timely filing of such a request, the decision shall be deemed a provisional decision with an effective date twenty-one (21) days after the Department's receipt of the request. Such a request shall reopen the administrative record, and the Department may rescind, supplement, modify, or reaffirm its decision. Failure by the Town to exercise the right provided in this section shall constitute a waiver of the Town's right to appeal.

Appeal. Any person aggrieved by the issuance of this decision may file an appeal for judicial review of said decision in accordance with the provisions of M.G.L. c. 111, s. 150A, and M.G.L. c. 30A, not later than thirty (30) days following the receipt of the final decision. The standing of a person to file an appeal and the procedures for filing such appeal shall be governed by the provisions of M.G.L. c. 30A. Unless the person requesting an appeal requests and is granted a stay of the terms and conditions of the decision by a court of competent jurisdiction, the decision shall remain effective.

Notice of Action. Any aggrieved person intending to appeal this decision to the Superior Court shall first provide notice to the Department of their intention to commence such action. Said notice of intention shall include the Department file number and shall identify with particularity the issues and reasons why it is believed the decision was not proper. Such notice shall be provided to the Office of General Counsel of the Department and the Regional Director for the regional office which processed the application. The appropriate addresses to which to send such notices are:

General Counsel
Massachusetts Department of Environmental Protection
One Winter Street – 3rd Floor
Boston, MA 02108

Regional Director
Massachusetts Department of Environmental Protection
Northeast Regional Office
205B Lowell Street
Wilmington, MA 01887

No allegation shall be made in any judicial appeal of this decision unless the matter complained of was raised at the appropriate point in the administrative review procedures established in those regulations, provided that a matter may be raised upon a showing that it is material and that it was not reasonably possible with due diligence to have been raised during such procedures or that matter sought to be raised is of critical importance to the environmental impact of the permitted activity.

If you have any questions in regards to this matter, please contact David Adams at phone 978-694-3295.

Sincerely,

David C. Adams
Environmental Engineer
Solid Waste Management

Sincerely,

John A. Carrigan
Section Chief
Solid Waste Management

JAC/DCA/dca
enclosure: Fact Sheet
cc:

Andover Board of Health
Town Offices
36 Bartlet Street
Andover, MA 01810
health@andoverma.gov

Andrew B. Miller
CDM Smith, Inc.
One Cambridge Place
50 Hampshire Street
Cambridge, MA 01239

Facility: Ledge Road Landfill
Address: Ledge Road
Andover, MA

Owner/operator: Town of Andover
Department of Public Works
Address: Water Filtration Plant
397 Lowell Street
Andover, MA 01810

Facility Number: 269388[1]
Regulated Object Number: 172286
Permit Number: none

Location[2]: 42^0 40' 16" North Latitude 71^0 11' 27" West Longitude

MSPCS:	225,342 mE	935,660 mN	Mainland Zone	NAD 83
UTM:	320,473 mE	4,726,620 mN	Zone 19	

Size of site: 25.8 acres
Waste disposal area: 20 acres

Current Application:
Type: Corrective Action Alternatives Analysis (BWPSW24)
Transmittal Number: X234306
Date: February 6, 2012

Engineer of Record:
CDM Smith, Inc.
One Cambridge Place
50 Hampshire Street
Cambridge, MA 01239
Andrew B. Miller, PE

MEPA: Environmental Notification Form
MEPA # 13514
Secretary's Certificate: May 23, 2005
Status: no Environmental Impact Report (EIR) required.

Capacity: closed to receipt of waste

Type of waste: municipal solid waste, yard waste

[1] Formerly Facility Number 39026.
[2] For reference only. Estimated by MassDEP from MassGIS.

Other actions effecting this application:

Location to be Investigated (LTBI)
RTN: 3-1625
LSP opinion: Adequately Regulated Solid Waste Facility; August 2, 1995

Comprehensive Site Assessment
Transmittal # W008778
approved: July 21, 2001

Public Involvement Plan (PIP)
RTN: 3-1625
Public Involvement Plan
Corrective Actions at Ledge Road Landfill
Town of Andover, Massachusetts
July 2006

Corrective Action Design
Ledge Road Landfill Closure – Phase 1
Transmittal # W105773
October 2007
amended: July 24, 2008
approved: August 26, 2008

Imminent Hazard Evaluation
RTN: 3-27632
Date: April 15, 2008

Supplemental Comprehensive Site Assessment
Arsenic Investigation
File # none
Date: September 2008

Submittals as part of this application:

report:
Corrective Action Alternatives Analysis
Ledge Road Landfill
Andover, Massachusetts
January 2012

Discussion:

The landfill is located on Ledge Road in Andover, Massachusetts. The landfill is abutted by Chandler Road, Ledge Road and Greenwood Road along the easterly side; by a residential property (170 Greenwood Road, Assessors Map Lot 147-18, owner not identified) on the southerly side; and by the "Park Property" (Assessors Map Lot 147-4) on the westerly and northerly sides.

The landfill occupies two (2) parcels owned by the Town of Andover, identified as Assessors Map Lots 147-2 and 147-7. A small area of waste has also been identified as extending onto the abutting "Park Property".

Prior to use as a municipal solid waste disposal facility the site was a pit for the mining of gravel. Beginning in the 1940's the site began landfilling municipal solid wastes (MSW) as an open pit burning dump. Circa late 1961/early 1962, the Town discontinued open burning and converted the landfill to a "sanitary landfill". Disposal of MSW was discontinued in 1972. In 1980 a portion (northerly end) of the site was covered with soil and converted to use as baseball and soccer fields.

Following the end of disposal of MSW at the site, the site continued to be used to dispose of leaves, brush and grass clippings (i.e. yard waste). The application does not discuss the method(s) of operation used for the disposal of the yard waste. The end for use of the site for the disposal of wastes by landfilling has not been identified.

Easterly and southerly of the landfill (Greenwood Road and Pettingell Avenue) are single family residences. West of the landfill is Interstate Route I-93. An area of undeveloped land, characterized by intermixed upland and wetland, separates the landfill from I-93. North of the landfill is a farm.

Wetlands are located along the westerly and southerly sides of the landfill. The wetlands drain, via unnamed intermittent streams, across the "Park Property" and the "AVIS Property" (Assessors Map Lot 148-8, et al)[3] to Fish Brook. Additional isolated wetlands are located at the southeasterly corner of the site.

Fish Brook is a component of the Town of Andover public water supply.[4] The wetlands west of the landfill have been delineated as part of the Zone A for the water supply.

---

[3] Property owned and managed by Andover Village Improvement Society ("AVIS").

[4] Fish Brook is dammed at its confluence with the Merrimack River. From the small reservoir created by the dam, water is pumped to Haggetts Pond. From Haggetts Pond water is drawn to the Andover Filtration plant for distribution in the Andover public water supply.

A small pond is located adjacent to the waste, on the landfill site, at the northwesterly corner of the site. Additional small ponds are located on the "Park Property" within this general area. The ponds drain past the landfill, through the wetlands, to Fish Brook.

Ground water flow at the site has been determined to be from the northeast (area of Ledge Road), across the site, to the wetlands (southwest of the landfill).

Contamination from the landfill has been identified in the wetlands on the "Park Property" and further downstream in the wetlands on the "AVIS Property". The contamination has been identified to follow the unnamed intermittent streams to and across I-95, extending approximately five hundred (500) feet into the wetlands west of I-95.

Pursuant to results of the Comprehensive Site Assessment (CSA):

- The landfill has been determined to have contributed contamination by Arsenic (As) and Iron (Fe) to the wetlands. The landfill is located within an area of Arsenic bearing soils. The landfill creates reducing conditions which may mobilize Arsenic present in the soil and/or within wastes disposed of in the landfill.

- Contamination by Polycyclic Aromatic Hydrocarbons (PAHs) is present in the wetlands. The PAH contamination is limited to location in the vicinity of storm water discharges. The PAH contamination is consistent with concentrations in historic fill and is attributed to discharges of storm water from area roadways and/or historic fill materials used as cover soil at the landfill.

- Contamination by Volatile Organic Compounds (VOCs) is present in the wetlands. The VOC contamination is limited to the area within or immediately adjacent to the landfill and is, therefore, not of concern to downstream receptors.

The Corrective Action Alternatives Analysis considered six (6) alternative actions:

ALT-1, No Action;
ALT-2, HDPE cap[5] with ground water extraction via wells and chemical/physical treatment of the extracted ground water;
ALT-3, a semi-permeable soil cap[6] with ground water extraction via wells and chemical/physical treatment of the extracted ground water;
ALT-4, HDPE cap with ground water collection via a collection trench and treatment of the collected ground water via an aerated pond and manmade wetland;

[5] High Density Poly-Ethylene flexible membrane (HDPE FML).
[6] Permeability the soil of between $1.0x10^{-6}$ to $1.0x10^{-4}$ cm/sec.

ALT-5, a semi-permeable soil cap with ground water collection via a collection trench and treatment of the collected ground water via an aerated pond and manmade wetland; and
ALT-6, a semi-permeable soil cap with treatment of ground water in-place by air sparging.

All alternatives, except the "no action" alternative, include restoration of the wetland to remove Arsenic from the wetlands to reduce residual Arsenic concentrations to less than 900 mg/kg in the stream sediments, as well as acquisition of property rights (easements and/or title) to limit/control future access to the area of Arsenic contamination.

Ground water flow at the site was modeled using DYNFLOW. Within the accuracy of the model, CDMSmith concludes ground water extraction (wells or trench), with or without an impervious cap (HDPE FML, etc.), will lower ground water under the landfill to or below the bottom of waste. MassDEP observes that a semi-permeable soil cap, by retaining the generation of leachate via infiltration of rain and snow melt into the waste, may retain a hydraulic connection of the contaminants in the waste to the surficial aquifer.

The CAAA includes "typical cap cross-sections" (Figure 5-2) to be included in the final closure design. The cross-section provided for the options using an "alternate soil cap" is not demonstrated to meet the requirements of 310 CMR 19.112(9) – i.e. topsoil is only six (6) inches in thickness, verses eight (8) inches required minimum [twelve (12) inches if the organic content of the topsoil is less than eight (8) percent]. The cross-section provided for the "alternate soil cap" also does not conform to 310 CMR 19.112(7) – i.e. does not include lateral drainage of water permeating the topsoil.

Irrespective of infiltration of rain or snow melt through the waste, CDMSmith has concluded that treatment of the extracted ground water will be required to protect the wetlands from further contamination by Arsenic.

Based on a combination of total present day value of costs and control of future release of Arsenic to the wetlands, CDMSmith has recommended ALT-5 as the preferred alternative.

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Northeast Regional Office • 205B Lowell Street, Wilmington MA 01887 • 978-694-3200

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Matthew A. Beaton
Secretary

Martin Suuberg
Commissioner

JUN 19 2015

Christopher Cronin, Acting Director
Town of Andover
Department of Public Works
397 Lowell Street
Andover, MA 01810

RE: ANDOVER – Solid Waste/COR
Ledge Road
Ledge Road Landfill
FMF # 269388
BWP SW-11 Major Modification of a Landfill
Planning Activities to Support the Recommended Corrective Action Alternative
Conditional Approval
Transmittal # X264827

Dear Mr. Cronin:

The Massachusetts Department of Environmental Protection, Northeast Regional Office, Bureau of Air and Waste, Solid Waste Section ("MassDEP") has reviewed the Town of Andover's (the "Town") application, category BWP SW-11- *Major Modification of a Landfill,* Transmittal No. X264827, for approval of the Town's Recommended Corrective Action Alternative ("CAA") for the Ledge Road Landfill, Ledge Road, Andover, Massachusetts. CDMSmith Inc. of Cambridge, Massachusetts ("CDMSmith") prepared and submitted the CAA to the MassDEP on behalf of the Town.

This information is available in alternate format. Call Michelle Waters-Ekanem, Diversity Director, at 617-292-5751. TTY# MassRelay Service 1-800-439-2370
MassDEP Website: www.mass.gov/dep

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DISCUSSION

Background

Between circa 1946 and 1972 the Town operated a landfill for the disposal of municipal solid wastes ("MSW") off Ledge Road in Andover, Massachusetts ("Landfill"). Following the termination of disposal of MSW, the landfill continued operating for the disposal of leaves, brush and grass clippings (i.e. yard waste). The waste materials were subsequently covered by various types of soil, however, a landfill cap was never completed.

The northern portion of the Landfill is used as athletic playing fields. The Town of Andover Department of Public Works (the "DPW") uses the southern portion of the Landfill for the stockpiling and processing of brush, street sweepings, catch basin cleanings, and other material generated by the DPW.

The Landfill is located within the Merrimack River Basin at the upper drainage boundary of the Fish Brook drainage area. Surface water and groundwater flows from the Landfill into the wetland and two unnamed intermittent streams that abut the Landfill to the southwest and from there to Fish Brook. Fish Brook then flows to the northwest into the Merrimack River. The Town of Andover operates a surface water pump station on Fish Brook at its confluence with the Merrimack River. As a result, Fish Brook and the upgradient surface waters and wetlands are classified as a Class A Surface Water Source and Outstanding Resource Water ("ORW").

The Town has been conducting an ongoing comprehensive environmental assessment of the Landfill in accordance with 310 CMR 19.150. Arsenic and iron have been detected at concentrations of concern in the groundwater, surface water, and wetland sediments down gradient of the Landfill. This includes the presence of iron staining and flocculent within the wetlands.

In 2008, after the detection of elevated arsenic concentrations in the wetland sediment downgradient of the landfill, the Site was assigned Release Tracking Number ("RTN") 3-27632 and the Town conducted an Imminent Hazard evaluation in accordance with 310 CMR 40.0955 of the Massachusetts Contingency Plan ("MCP"). As a result, the Town developed and implemented an Immediate Response Action ("IRA") Plan that required installation of no trespassing signs around the landfill, additional fencing to limit access from the playing fields, and several locked gates to prevent vehicular access to the landfill and surrounding areas.

Corrective Action Alternative Analysis, February 6, 2012

On February 6, 2012, the Town submitted an application category, BWP SW24 *Corrective Action Alternative Analysis*, that proposed and evaluated a number of corrective action alternatives for capping the Landfill and addressing the arsenic and iron contamination in the groundwater, surface water, and wetlands. The CAAA recommended, without limitation:

- Placement of an alternative low permeability soil cap on the Landfill;
- Installation of a groundwater collection trench along the downgradient edge of the Landfill coupled with an aeration/settling pond/wetland treatment system to prevent the discharge of groundwater containing elevated concentrations of arsenic and iron to the downgradient wetlands;

- The removal and off-site disposal of wetland sediments downgradient of the Landfill that contain greater than 900 mg/kg of arsenic;
- Access restrictions (fencing, signs, etc.); and
- Post-closure monitoring and inspection.

MassDEP approved the CAAA on May 9, 2012. However, based on the results of environmental assessment and field sampling, it was determined that additional field investigations and sampling were necessary to further delineate the degree and extent of arsenic contamination on and surrounding the Landfill.

Supplemental Investigations

The supplemental investigations included, but were not limited to:

- Installation of 18 additional monitoring wells at multiple depths in both overburden and bedrock;
- Installation of a 6" diameter test well and performance of a 48 hour pumping test;
- Three rounds of bench-scale treatability testing on groundwater samples;
- Continued landfill gas and water quality monitoring.

CDMSmith determined during the supplemental investigations that:

- The arsenic and iron plume in the groundwater follows the regional surface water/wetland flow to the southeast;
- The occurrence of arsenic at a concentration of greater than 10 ug/l (the Massachusetts Drinking Water Standard) is limited to the east of Interstate Route 93 in an area that extends 750 feet from the Landfill; and
- 1,4-dioxane was detected in the groundwater at concentrations ranging from 2 to 22 ug/L above the Massachusetts drinking water guideline for 1,4 dioxane of 0.3 ug/L in eight groundwater monitoring wells at the down gradient edge of the Landfill.

The supplemental investigations confirmed CDMSmith's original conceptual site model that the landfill waste is located within the vertical limit of the groundwater table, creating chemically reducing conditions. These conditions cause the mobilization of arsenic and iron.

Precipitation and surface water infiltration through landfilled waste also contributes to the reducing conditions beneath the landfill and the mobilization of the arsenic and iron. When groundwater discharges to the surface water and the wetlands, it encounters oxidizing conditions and the arsenic and iron co-precipitate and are deposited onto downgradient wetland sediments. The arsenic and iron are then transported downstream.

Groundwater Treatability Studies

CDMSmith performed three treatability studies to evaluate the treatment train proposed in the CAAA to remove the arsenic and iron from the groundwater prior to its discharge into the surface water and wetland. CDMSmith concluded that the removal of the arsenic from the groundwater cannot be achieved by aeration/settling as proposed in the CAAA.

The addition of hydrogen peroxide is required to remove the arsenic to meet the anticipated NPDES standards for discharge of the treated groundwater into the ORW. CDMSmith also

concludes that the addition of hydrogen peroxide to the groundwater treatment train requires the addition of a coagulant.

The detection of 1,4 Dioxane above the Massachusetts drinking water guideline of 0.0003 mg/l required CDMSmith to consider the 1,4 Dioxane's impact on the groundwater treatment train. CDMSmith states that the treatment of 1,4 Dioxane requires a complex oxidation process that includes a combination of ultraviolet (UV) and peroxide or peroxide and ozone. CDMSmith also states that the treatment for 1,4 Dioxane must occur after the removal of the arsenic and iron and the quality of the water from the settlement pond (after the treatment of the arsenic and iron) may not be sufficient for UV treatment requiring further modification of the treatment train to address this issue.

As a result, CDMSmith calculated the impact of the additional treatment trains on the cost to remediate the groundwater at the site. They estimate the cost would increase from the $8,800,000 for the system proposed in the CAAA; to $12,430,000 for a modified system that includes the addition of hydrogen peroxide and a coagulant to remove the arsenic and iron; and to $22,020,000 for a system that includes 1,4 Dioxane treatment.

Recommended Corrective Actions

Therefore, CDMSmith proposes to revise the corrective actions approved in the CAAA to the following corrective actions.

1. *Standard HDPE Cap with Passive Landfill Gas System*: Replace the alternative soil cap proposed and approved in the CAAA with a standard MassDEP solid waste (HDPE) cap to eliminate infiltration through the landfill surface to the maximum extent. The goal is to lower the water table below the vertical limits of the waste.
2. *Monitoring of the Groundwater, Surface Water, and Wetland*: Continued monitoring of the groundwater, surface water, and wetland to determine the effectiveness of the capping and determine whether additional remediation of the groundwater is required.
3. *Impacted Wetland Sediment Removal:* The excavation and removal of approximately 0.5 acres of arsenic-impacted sediments in excess of 900 mg/kg from the wetland to achieve a Condition of No Significant Risk, as defined under the MCP. The sediment would be placed in the Landfill beneath the HDPE cap and the wetlands will be replicated.
4. *Institutional and Engineering Controls:* The implementation of institutional and engineering controls that include, but are not limited to, the acquisition of adjacent impacted parcels and the required deed notices and restrictions pursuant to 310 CMR 19.000 and consistent with the MCP.

Schedule

The Town included the following timelines in the CAA for proceeding with the proposed corrective actions.

- *April 1, 2015 – July 1, 2015 Pre-Design Phase: existing conditions/topographic survey, wetland delineation, sediment sampling, test pits, post-closure use decisions;*

- *July 1, 2015 – December 1, 2015 60% Design Phase and Wetland Permit Application Submittals: Each of the following permit applications to be prepared and submitted to respective agencies by November 1, 2015, which will initiate the review period.*
  - *File Notice of Project Change with MEPA for a determination if an Environmental Impact Report ("EIR") is required. (The Secretary's May 23, 2005, Certificate for the original Environmental Notification Form ("ENF") did not require an EIR.)*
  - *Notice of Intent to Andover Conservation Commission*
  - *Section 401 Water Quality Certification to MassDEP, and*
  - *Section 404 Permit Application to U.S. Army Corps of Engineers (ACOE);*
- *December 1, 2015 – June 1, 2016 Final Design and Wetland Permit Application Reviews;*
- *The following will be submitted to MassDEP-NERO Solid Waste by June 1, 2016:*
  - *Corrective Action Design (CAD) Report, and*
  - *Post-Closure Use Permit;*
- *June 1, 2016 – August 1, 2016 CAD Review and Approval by MassDEP;*
- *August 1, 2016 – October 1, 2016 Bidding & Contract Award;*
- *October 1, 2016 – December 31, 2017 Construction; and*
- *January 1, 2018 – March 31, 2018 Certification Report.*

DECISION

The MassDEP has reviewed the CAA pursuant to 310 CMR 19.000, the Solid Waste Management Regulations, and for consistency with the guidelines of MassDEP's Landfill Technical Guidance Manual (DEP Publication No. SWMID: 001-91-G, Rev. 5/97). MassDEP has determined that the application as conditioned by this decision, complies with the requirements of 310 CMR 19.000.

Therefore, in accordance with M.G.L. Chapter 111, § 150A and 310 CMR 19.000, MassDEP approves the CAA subject to the Town's compliance with the following conditions imposed by MassDEP pursuant to 310 CMR 19.043(1) and 310 CMR 19.150(2)(a).

1. The Town shall comply with 310 CMR 19.000 including, but not limited to section 310 CMR 19.043(5) Standard Conditions of the Solid Waste Management Regulations.
2. The Town shall comply with 310 CMR 40.0000, the Massachusetts Contingency Plan including, but not limited to section 310 CMR 40.0114 *Solid Waste Management Facilities.*
3. The Town shall continue environmental monitoring of the Landfill pursuant to 310 CMR 19.132 including, without limitation, semi-annual groundwater and surface water monitoring and quarterly landfill gas monitoring pursuant to the environmental monitoring plan approved by the MassDEP on March 26, 2008.
4. The Town shall submit to the MassDEP on or before September 30, 2015, a report that presents the results of the Pre-Design Phase activities discussed above that includes, but is not limited to:
   a. A narrative summary/discussion of the Pre-Design Phase Activities including, but not limited to, the impact on the Recommended Corrective Action Design;

b. The updated topographic survey and wetland delineations;

c. The results of the additional sediment sampling and any other environmental sampling performed as part of the Pre-Design Phase Activities; and

d. The status of a determination of a post-closure use(s) for the Landfill and if a post-closure use has been selected the impact of the selection, if any, on the Recommended Corrective Action.

e. An updated proposed corrective action schedule.

The Town shall submit the report required by this paragraph to the MassDEP as an application category BWP 45 *Any Facility - Presumptive Approval* pursuant to 310 CMR 4.00.

5. The Town shall provide the MassDEP (that is, the NERO Solid Waste Section) with copies of all other submittals described in the Schedule discussed above.

6. The Town shall submit to the MassDEP on or before June 1, 2016, pursuant to 310 CMR 4.00 an application, category BWP SW SW25: *Corrective Action Design,* (the "CAD Application") for implementing the corrective actions proposed in the CAA including, but not limited to, the closure and capping of the Landfill and wetland remediation. The CAD Application shall comply with 310 CMR 19.000 including, but not limited to, the requirements of *Part II: Landfill Design and Operational Standards* (310 CMR 19.100 through 310 CMR 19.151). In addition, the CAD Application shall include, but not be limited to, an evaluation of alternatives for the removal of wetland sediments to action levels of less than 900 mg/kg and a schedule for the implementation of Corrective Action Design. The CAD Application shall include a projected schedule for implementing the principle milestones of the Corrective Action Design.

7. The site is designated a Public Involvement Plan site pursuant to 310 CMR 40.0114. Therefore, the Town provide for the placement of the CAD Application in the PIP repository and for a public meeting pursuant to the PIP Plan for the project. In addition, the MassDEP will issue the decision on the CAD Application as a provisional decision pursuant to 310 CMR 19.033(4)(a) with a thirty (30) day period for the submittal of comments by interested parties.

NOTICE OF RIGHT TO APPEAL

The Town of Andover (the "Town") is hereby notified that it may within twenty-one (21) days of the date of issuance of this decision file a request that this decision be deemed a provisional decision under 310 CMR 19.033(4)(b), by submitting a written statement of the basis on which the Town believes it is aggrieved, together with any supporting materials. Upon timely filing of such a request, the decision shall be deemed a provisional decision with an effective date twenty-one (21) days after the MassDEP's receipt of the request. Such a request shall reopen the administrative record, and the MassDEP may rescind, supplement, modify, or reaffirm its decision. Failure by the Town to exercise the right provided in this section shall constitute a waiver of the Town's right to appeal.

Appeal. Any person aggrieved by the issuance of this decision may file an appeal for judicial review of said decision in accordance with the provisions of M.G.L. c. 111, s. 150A, and M.G.L. c. 30A, not later than thirty (30) days following the date of issuance of the final decision. The standing of a person to file an appeal and the procedures for filing such appeal shall be governed by the provisions of M.G.L. c. 30A. Unless the person requesting an appeal requests and is granted a stay of the terms and conditions of the decision by a court of competent jurisdiction, the decision shall remain effective.

Notice of Action. Any aggrieved person intending to appeal this decision to the Superior Court shall first provide notice to the MassDEP of their intention to commence such action. Said notice of intention shall include the MassDEP's file number and shall identify with particularity the issues and reasons why it is believed the decision was not proper. Such notice shall be provided to the Office of General Counsel of the MassDEP and the Regional Director for the regional office which processed the application at least five (5) days prior to the filing of an appeal. The appropriate addresses to which to send such notices are:

General Counsel
Massachusetts Department of Environmental Protection
One Winter Street – 3rd Floor
Boston, MA 02108

Eric Worrall, Regional Director
Massachusetts Department of Environmental Protection
Northeast Regional Office
205B Lowell Street
Wilmington, MA 01887

No allegation shall be made in any judicial appeal of this decision unless the matter complained of was raised at the appropriate point in the administrative review procedures established in those regulations, provided that a matter may be raised upon a showing that it is material and that it was not reasonably possible with due diligence to have been raised during such procedures or that matter sought to be raised is of critical importance to the environmental impact of the permitted activity.

If you have any questions about this matter, please contact John Morey at (978) 694-3297.

Sincerely,

John P. Morey
Environmental Analyst

Sincerely,

John A. Carrigan
Section Chief
Solid Waste Management

JAC/JM/jpm

cc:

Andover Board of Health
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Commonwealth of Massachusetts
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Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Matthew A. Beaton
Secretary

Martin Suuberg
Commissioner

November 24, 2015

Mr. Chris Cronin
Town of Andover- DPW
Water Filtration Plant
397 Lowell Street
Andover, MA 01810

RE: Andover - Solid Waste/COR
Ledge Road Landfill
Ledge Road
FMF# 39026
BWP SW45 *Any Facility – Alternative Review*
Summary of Pre-Design Phase and Planned Corrective Action Activities
Transmittal No. X267855
DECISION - APPROVAL

Dear Mr. Cronin:

On October 14, 2015, the Massachusetts Department of Environmental Protection, Northeast Regional Office, Bureau Air and Waste, Solid Waste Section ("MassDEP") received an Application, category BWP SW45 – *Alternative Review*, Transmittal Number X267855, for the Ledge Road Landfill in Andover, Massachusetts.CDM Smith, Inc., Boston, Massachusetts ("CDM Smith"), prepared and submitted the Application, dated October 13, 2015, to MassDEP on behalf of the Town of Andover (the "Town").

The Application was submitted to MassDEP in response to Condition 4 of the Conditional Approval for Planning Activities to Support the Recommended Corrective Action Alternative ("CAA"), dated June 19, 2015. Condition 4 of the CAA required the Town to report on Landfill closure activities including the following:

a. A narrative summary of the Pre-Design Phase Activities;
b. The updated topographic survey and wetland delineations;
c. The results of the Pre-Design Phase environmental sampling;
d. A determination of possible post-closure use(s) for the Landfill; and
e. Updated proposed Corrective Action Schedule.

This information is available in alternate format. Call Michelle Waters-Ekanem, Diversity Director, at 617-292-5751. TTY# MassRelay Service 1-800-439-2370
MassDEP Website: www.mass.gov/dep
Printed on Recycled Paper

The Application includes responses to each of the listed requirements a. through e. below.

a. *Summary of the Pre-Design Phase Activities*

The Town and CDM Smith conducted the following Pre-Design Phase activities:

1. confirmed the extent of landfilled waste;
2. established the limits of the downgradient wetlands;
3. more accurately established the extent of wetland sediments with elevated arsenic concentrations downgradient from the Landfill; and
4. determined the final post-closure use for the landfill.

b. Updated topographic survey and wetland delineation

In June 2015, CDM Smith wetland scientists delineated wetland resource areas surrounding the landfill including the downgradient wetland areas requiring removal of sediments containing arsenic. Wetland flags were reportedly surveyed and incorporated onto the existing conditions plans. An Abbreviated Notice of Resource Area Delineation (ANRAD) was prepared and submitted by CDM Smith to the Andover Conservation Commission (the Con Com) on September 21, 2015 (Appendix B of the Application). The ANRAD is being review by the Con Com. The Application indicates the ANRAD approval is expected in November 2015.

c. Results of environmental sampling performed as part of the Pre-Design Phase Activities

The Application states a two phased sediment sampling program was conducted in June and August 2015. The objective of this program was to confirm the extent of the previously identified areas of elevated arsenic with greater than 900 mg/kg (Appendix C of the Application). Five "hot spot" areas in the wetland (See Figure 1 of Appendix C) sediments downgradient of the landfill were identified for excavation and relocation under the proposed landfill cap.

Two areas remain for further confirmatory sediment sampling. Once that sampling is complete, the areas proposed for hot spot removal will be delineated and presented in the CAD. The CAD will also address MassDEP's requirement for an evaluation of alternatives for the removal of wetland sediments to action levels less than 900 mg/kg.

In addition, a confirmatory test pit program (17 test pits) was conducted in July 2015 at select locations around the perimeter of the landfill to confirm the edge-of-waste (Appendix D of the Application). The Application states no further test pit investigations are recommended with the possible exception of one area of the ballfield parking lot along Chandler Road to confirm waste depth. The need for any additional test pits will be determined during the CAD activities.

d. Determination of post-closure use(s) for the Landfill

Post-closure uses for the Landfill were selected on October 5, 2015 by the Town of Andover Board of Selectmen to include the following:

- Continued use of a portion of the Landfill as a Department of Public Works (DPW) Materials Handling Area: An approximate six acre area will continue to be used for the storage,

handling and processing of various materials generated and/or required by DPW operations, and will include improved vehicle access.

- Possible future installation of a Solar Photovoltaic (PV) Array: The Site will be graded for a possible future solar array on the Landfill.

The final layout and design of the post-closure uses will be developed as part of the CAD.
A Post-Closure Use Permit Application (Major Modification) is expected to be submitted to MassDEP by June 1, 2016.

e. Updated proposed corrective action schedule

The revised corrective action schedule is proposed with the following dates:

March 1, 2016 –Wetland Permit Application Submittals including:

- Notice of Project Change (NPC) or other documentation to MEPA to determine the need for an Environmental Impact Report (EIR);
- Notice of Intent to Andover Conservation Commission;
- Section 401 Water Quality Certification to MassDEP; and
- Section 404 Permit Application to U.S. Army Corps of Engineers (ACOE)

June 1, 2016 – Submit to MassDEP-NERO Solid Waste:

- Corrective Action Design Report (CAD); and
- Post-Closure Use (Major) Permit for DPW Materials Handling Area

June 1, 2016 – August 1, 2016 Bid Document Preparation and Approval by the Town.
August 1, 2016 – October 1, 2016 Bidding and Contract Award.
October 1, 2016 – December 31, 2017 Construction of the landfill cap.
January 1, 2018 – March 31, 2018 Certification Report.

The Application indicates the proposed schedule is subject to change based on delays with permit reviews and possible appeals.

DECISION

The MassDEP has reviewed the Application pursuant to 310 CMR 19.000, the Solid Waste Management Regulations, and for consistency with the guidelines of MassDEP's Landfill Technical Guidance Manual (DEP Publication No. SWMID: 001-91-G, Rev. 5/97). MassDEP has determined that the application as conditioned by this decision, complies with the requirements of 310 CMR 19.000.

Therefore, in accordance with M.G.L. Chapter 111, § 150A and 310 CMR 19.000, MassDEP approves the Application subject to the Town's compliance with the following conditions:

1. The Town shall comply with 310 CMR 19.000 including, but not limited to section 310 CMR 19.043(5) Standard Conditions of the Solid Waste Management Regulations.

2. The Town shall comply with 310 CMR 40.0000, the Massachusetts Contingency Plan including, but not limited to section 310 CMR 40.0114 Solid Waste Management Facilities.

3. The Town shall continue environmental monitoring of the Landfill pursuant to 310 CMR 19.132 this shall include, but is not limited to: Semi-annual groundwater and surface water monitoring and quarterly landfill gas monitoring in accordance with environmental monitoring plan approved by MassDEP on March 26, 2008.

4. When conducting environmental sampling, the Town shall ensure that analytical and environmental monitoring data is scientifically valid, defensible, and that the precision and accuracy of the data is commensurate with its stated use pursuant to the performance standards of 310 CMR 19.132(1), and section 310 CMR 40.0017 Environmental Sample Collection and Analysis of the Massachusetts Contingency Plan (the "MCP"). This shall include, but is not limited to, the analysis and submittal of laboratory in conformance with the guidelines of the MassDEP's Bureau of Waste Site Cleanup's Compendium of Analytical Methods (BWSC-CAM-VII A) found on MassDEP's website at the following link: http://www.mass.gov/eea/agencies/massdep/cleanup/regulations/wsc10-320-compendium--quality-control-reqs.html.

5. Summarize and report all laboratory data to MassDEP in a tabular format. If the concentration of an analyte is below the Practical Quantification Limit ("PQL") for the analytical method, the results for that analyte shall be reported as less than the stated PQL number (such as, "< 5 ug/l"), not as non-detect ("ND"), below detection limit ("BDL"), or zero.

6. The Town shall submit to MassDEP a monthly summary report of corrective action activities that are being conducted as part of the preparation for the Corrective Action Design. The report shall include an evaluation of the need to perform additional response actions, including but not limited to remedial actions at the Site. The monthly reports shall continue until the capping has been certified complete.

7. MassDEP approves the revised corrective action schedule above. If additional time is needed for submittal of reports or scheduled activities, the Town shall submit to MassDEP an extension request for MassDEP's review and approval. MassDEP may, at its sole discretion, extend any deadline established by this decision.

NOTICE OF RIGHT TO APPEAL

The Town of Andover (the "Town") is hereby notified that it may within twenty-one (21) days of the date of issuance of this decision file a request that this decision be deemed a provisional decision under 310 CMR 19.033(4)(b), by submitting a written statement of the basis on which the Town believes it is aggrieved, together with any supporting materials. Upon timely filing of such a request, the decision shall be deemed a provisional decision with an effective date twenty-one (21) days after the MassDEP's receipt of the request. Such a request shall reopen the administrative record, and the MassDEP may rescind, supplement, modify, or reaffirm its decision. Failure by the Town to exercise the right provided in this section shall constitute a waiver of the Town's right to appeal.

Appeal. Any person aggrieved by the issuance of this decision may file an appeal for judicial review of said decision in accordance with the provisions of M.G.L. c. 111, s. 150A, and M.G.L. c. 30A, not later than thirty (30) days following the date of issuance of the final decision. The standing of a person to file an appeal and the procedures for filing such appeal shall be governed by the provisions of M.G.L. c. 30A. Unless the person requesting an appeal requests and is granted a stay of the terms and conditions of the decision by a court of competent jurisdiction, the decision shall remain effective.

Notice of Action. Any aggrieved person intending to appeal this decision to the Superior Court shall first provide notice to the MassDEP of their intention to commence such action. Said notice of intention shall include the MassDEP's file number and shall identify with particularity the issues and reasons why it is believed the decision was not proper. Such notice shall be provided to the Office of General Counsel of the MassDEP and the Regional Director for the regional office which processed the application at least five (5) days prior to the filing of an appeal. The appropriate addresses to which to send such notices are:

General Counsel
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One Winter Street – 3rd Floor
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205B Lowell Street
Wilmington, MA 01887

No allegation shall be made in any judicial appeal of this decision unless the matter complained of was raised at the appropriate point in the administrative review procedures established in those regulations, provided that a matter may be raised upon a showing that it is material and that it was not reasonably possible with due diligence to have been raised during such procedures or that matter sought to be raised is of critical importance to the environmental impact of the permitted activity.

If you have any questions about this matter, please contact John Morey at (978) 694-3297.

Sincerely,

John P. Morey
Environmental Analyst

Sincerely,

Susan Ruch
Acting Solid Waste Section Chief and
Deputy Regional Director

SR/JM/jpm

cc:

Andover Board of Health
Town Offices
36 Bartlet Street
Andover, MA 01810
health@andoverma.gov

Andrew B. Miller
CDM Smith, Inc.
70 State Street, Suite 701
Boston, MA 02109

Bruce Haskell
Langdon Environmental, LLC.
Marlborough Office Center, Inc.
241 Boston Post Rd.-West
Marlborough MA 01752

Tom Adamczyk- MassDEP/Boston

75 State Street, Suite 701
Boston, Massachusetts 02109
tel: 617 452-6000
fax: 617 345-3901

July 1, 2016

Mr. Mark Fairbrother
Section Chief, Solid Waste Management
Massachusetts Department of Environmental Protection
Northeast Regional Office
205A Lowell Street
Wilmington, Massachusetts 01887

Subject: Proposed Schedule Revision – Corrective Action Implementation
Ledge Road Landfill Closure Project
Town of Andover, Massachusetts

Dear Mr. Fairbrother:

On behalf of the Town of Andover (the Town), CDM Smith is submitting for review and approval by the Massachusetts Department of Environmental Protection (MassDEP) a revised project schedule for Corrective Action implementation to achieve closure of the former Ledge Road Landfill.

Background

A project implementation schedule was previously presented in the October 14, 2015 pre-design submittal to MassDEP. That schedule was approved in MassDEP correspondence dated November 24, 2015. Condition #7 of that approval required submission of an extension request should additional time be required to accomplish the required activities.

Through monthly reports submitted via email, we have been keeping MassDEP apprised of our progress. These monthly reports have documented schedule delays due to additional permitting requirements such as vernal pool identification and Massachusetts Environmental Policy Act (MEPA) review. In addition, it was stated that a revised project schedule would be submitted to MassDEP once MEPA review requirements were determined. Having met with MEPA on June 6, 2016, it is now understood that an Environmental Notification Form (ENF) must be prepared and submitted.

Proposed Corrective Action Implementation Schedule Revision

Based on the current project status and understanding of permit requirements, the following presents the revised Corrective Action schedule for closure of the former Ledge Road Landfill.

September 1, 2016 – Submit ENF to MEPA

- Submittal will be based on the 30% design phase

November 1, 2016 – Submit Wetland Permit Applications

- Submittals will be based on completion of the 60% design phase
- Notice of Intent to Andover Conservation Commission
- Section 401 Water Quality Certification to MassDEP
- Section 404 permit Application to U.S. Army Corps of Engineers (ACOE)

January 15, 2017 – Submit to MassDEP-NERO Solid Waste

- Corrective Action Design Report (CAD)
- Post-Closure Use (Major) Permit for DPW Materials Handling Area

April 30, 2017 – Anticipated CAD, Post-Closure Use and Wetland Permit Approvals

March 1, 2017 – June 15, 2017 – Bid Document Preparation and Approval by the Town

June 15, 2017 – September 1, 2017 – Bidding and Contract Award

September 1, 2017 – May 15, 2019 – Construction

- Assumes 15 month construction duration with two 11 week winter shutdowns (late-December to mid-March)

August 1, 2019 – Submit Certification Report to MassDEP-NERO Solid Waste

Assumptions regarding the schedule are as follows:

1. ENF Certificate issued within approximately 5 weeks of submission. In the case of significant comments to MEPA, an extension of the review period might be requested.
2. No Environmental Impact Report (EIR) required. An EIR requirement would result in a schedule extension.
3. Town has elected to forgo State Revolving Fund (SRF) loan.
4. Assumes an ACOE General Permit; an ACOE Individual permit could extend the review timeline.

5. Allowance for up to 6 month review of wetland permit filings, as 401 Water Quality Certification (WQC) is known to take that long.

6. Assumes no historical and/or archaeological studies required.

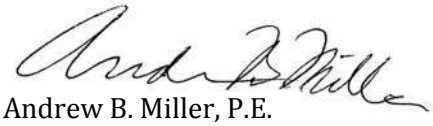
7. Assumes no bat studies required. Timeline established to avoid need for tree clearing in June and July in the case that bat habitat is identified by the Natural Heritage and Endangered Species Program (NHESP).

8. Schedule assumes no permit appeals; any permit appeals filed would result in schedule delays.

9. An updated corrective action implementation schedule will be included with submission of the CAD to address any potential schedule modifications resulting from permitting concerns.

We appreciate your consideration of the revised project schedule and look forward to working with you in implementing the Corrective Action. Please feel free to call me at (617) 452-6532 if you have any questions or require additional information.

Sincerely,



Andrew B. Miller, P.E.
Associate/Senior Project Manager
CDM Smith Inc.

c: Christopher Cronin, Andover Director of Municipal Services (copy and electronic)
Marc Fournier, Andover Deputy Director of Public Works and Landfill Project Manager (electronic)
John Morey, MassDEP-NERO (electronic)
Richard Spieler, MassDEP-NERO (electronic)
Information Repository (eRoom and 2 copies c/o M. Fournier)

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Northeast Regional Office • 205B Lowell Street, Wilmington MA 01887 • 978-694-3200

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Matthew A. Beaton
Secretary

Martin Suuberg
Commissioner

APR 11 2017

Christopher Cronin
Town of Andover
Department of Public Works
397 Lowell Street
Andover, MA 01810

RE: ANDOVER – Solid Waste Management
Ledge Road Landfill
Ledge Road
FMF# 269388

BWP SW22/Minor Modification
Transmittal No.: X273906

Modification of Ambient Air Monitoring Program
Conditional Approval

Dear Mr. Cronin:

The Massachusetts Department of Environmental Protection, Northeast Regional Office, Bureau of Air and Waste, Solid Waste Management Section ("MassDEP") has reviewed your application, category BWP SW22 – *Minor Modification,* Transmittal Number: X273906 (the "Application"), regarding the request to discontinue ambient air quality monitoring at the athletic fields at the Ledge Road Landfill located in Andover, Massachusetts (the "Landfill"). The Application was prepared by CDM Smith, Inc. of Boston, Massachusetts ("CDM") on behalf of the Town of Andover (the "Town").

The current Environmental Monitoring Plan for the Landfill, dated February 2008 and approved by MassDEP on March 26, 2008 (the "2008 EMP"), includes ambient air quality monitoring of the athletic fields. The air monitoring activities include semi-annual characterization of landfill gas collected with Summa canisters and analyzed for volatile organic compounds. The 2008 EMP also includes semi-annual methane screening of the athletic fields. According to the Application, the

This information is available in alternate format. Contact Michelle Waters-Ekanem, Director of Diversity/Civil Rights at 617-292-5751.
TTY# MassRelay Service 1-800-439-2370
MassDEP Website: www.mass.gov/dep
Printed on Recycled Paper

Town closed the athletic fields in late 2016 and the fields will no longer be used for recreational purposes. In addition, the Town is proposing to cap the Landfill, including the area of the athletic fields, as part of landfill closure activities. Therefore, the Town proposes to discontinue the ambient air monitoring at the former athletic fields. The Town will continue to conduct quarterly landfill gas monitoring of the landfill gas wells and probes at the Landfill.

DECISION

MassDEP has reviewed the Application pursuant to 310 CMR 19.000, the Solid Waste Management Regulations. MassDEP approves the Application and discontinuance of ambient air monitoring of the former athletic fields at the Landfill, subject to the Town's compliance with the conditions of this decision imposed by MassDEP pursuant to 310 CMR 19.043(1), *Items Subject to Conditions*.

This decision is issued by MassDEP pursuant to M.G.L. Chapter 111, § 150A and the implementing regulations thereunder at 310 CMR 19.000, the Solid Waste Management Regulations. This decision does not relieve the Town, or any other person, of the responsibility to comply with all other applicable federal, state and local statutes, regulations and requirements. In issuing this decision, MassDEP is not approving closure activities at the Landfill. Landfill closure design will be the subject of separate review and approval by MassDEP.

CONDITIONS

1. In the event that the Town intends to reopen the athletic fields for recreational purposes, the Town must notify MassDEP in writing and the Town shall resume ambient air monitoring of the athletic fields in accordance with the previously approved 2008 EMP.

2. The Town shall comply with this permit and the requirements of 310 CMR 19.000, including, but not limited to, the requirements established at 310 CMR 19.043(5), *Standard Conditions*.

3. The Town shall comply with 310 CMR 40.0000, the Massachusetts Contingency Plan, including, but not limited to, section 310 CMR 40.0114: Solid Waste Management Facilities.

4. All terms and conditions of the Landfill's approved plans, including, but not limited to, the 2008 EMP, shall remain in full force and effect except as may be specifically modified by this decision. In accordance with the 2008 EMP, the Town shall continue to conduct quarterly landfill gas monitoring (four times a year) in accordance with 310 CMR 19.132 and the approved EMP.

5. The Town shall notify MassDEP of landfill gas exceedances and take appropriate action in accordance with the requirements of 310 CMR 19.132: Environmental Monitoring Requirements, which reads in relevant portion:

"(g) When, at any time, the concentration of explosive gasses exceeds 10% of the lower explosive limit (LEL) in any building, structure, or underground utility conduit, excluding gas control, gas recovery and leachate collection system components, the owner or operator shall:

1. take immediate action to protect human health and safety;
2. notify the Department's Regional Office that covers the municipality in which the facility is located within two hours of the finding; and
3. undertake the actions specified under 310 CMR 19.150: Landfill Assessment Requirements and 19.151: Corrective Action Requirements as required by the Department.

(h) Except in buildings, structures and underground utility conduits for which 310 CMR 19.132(5)(g) applies, when, at any time, the concentration of explosive gasses exceeds 25% of the lower explosive limit (LEL) at the property boundary or beyond, excluding gas control, gas recovery and leachate collection system components, the owner/operator shall:

1. take immediate action to protect human health and safety;
2. notify the Department's Regional Office that covers the municipality in which the facility is located within 24 hours of the finding; and
3. undertake the actions specified under 310 CMR 19.150: Landfill Assessment Requirements and 19.151: Corrective Action Requirements as required by the Department."

6. MassDEP reserves the right to rescind, suspend or modify this approval based upon a determination that discontinuing the air quality monitoring contributes to or results in a threat to the public health, safety or the environment.

NOTICE OF RIGHT TO APPEAL

The Town of Andover (the "Town") is hereby notified that it may within twenty-one (21) days of the date of issuance of this decision file a request that this decision be deemed a provisional decision under 310 CMR 19.033(4)(b), by submitting a written statement of the basis on which the Town believes it is aggrieved, together with any supporting materials. Upon timely filing of such a request, the decision shall be deemed a provisional decision with an effective date twenty-one (21) days after the MassDEP's receipt of the request. Such a request shall reopen the administrative record, and the MassDEP may rescind, supplement, modify, or reaffirm its decision. Failure by the Town to exercise the right provided in this section shall constitute a waiver of the Town's right to appeal.

Appeal. Any person aggrieved by the issuance of this decision may file an appeal for judicial review of said decision in accordance with the provisions of M.G.L. c. 111, s. 150A, and M.G.L. c. 30A, not later than thirty (30) days following the date of issuance of the final decision. The standing of a person to file an appeal and the procedures for filing such appeal shall be

governed by the provisions of M.G.L. c. 30A. Unless the person requesting an appeal requests and is granted a stay of the terms and conditions of the decision by a court of competent jurisdiction, the decision shall remain effective.

Notice of Action. Any aggrieved person intending to appeal this decision to the Superior Court shall first provide notice to the MassDEP of their intention to commence such action. Said notice of intention shall include the MassDEP's file number and shall identify with particularity the issues and reasons why it is believed the decision was not proper. Such notice shall be provided to the Office of General Counsel of the MassDEP and the Regional Director for the regional office which processed the application at least five (5) days prior to the filing of an appeal. The appropriate addresses to which to send such notices are:

General Counsel
Massachusetts Department of Environmental Protection
One Winter Street – 3rd Floor
Boston, MA 02108

and

Eric Worrall, Regional Director
Massachusetts Department of Environmental Protection
Northeast Regional Office
205B Lowell Street
Wilmington, MA 01887

No allegation shall be made in any judicial appeal of this decision unless the matter complained of was raised at the appropriate point in the administrative review procedures established in those regulations, provided that a matter may be raised upon a showing that it is material and that it was not reasonably possible with due diligence to have been raised during such procedures or that matter sought to be raised is of critical importance to the environmental impact of the permitted activity.

If you have any questions about this matter, please contact John Morey at (978) 694-3297.

Sincerely,

Mark G. Fairbrother
Section Chief
Solid Waste Management

John P. Morey
Environmental Analyst
Solid Waste Management

MGF/JPM/jpm

cc: Susan Ruch, Deputy Region Director, MassDEP-NERO/BAW
Email: susan.ruch@state.ma.us

Thomas Carbone, Director
Andover Department of Public Health
Town Offices
36 Bartlet Street
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Andrew Flanagan, Town Manager
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Email: aflanagan@andoverma.gov

Andrew Miller
CDM Smith
75 State Street, Suite 701
Boston, MA 02109
Email: MillerA@cdmsmith.com

Massachusetts Department of Environmental Protection
One Winter Street, Boston MA 02108 • Phone: 617-292-5751

Communication For Non-English Speaking Parties - 310 CMR 1.03(5)(a)

1 English:
This document is important and should be translated immediately. If you need this document translated, please contact MassDEP's Diversity Director at the telephone numbers listed below.

2 Español (Spanish):
Este documento es importante y debe ser traducido inmediatamente. Si necesita este documento traducido, por favor póngase en contacto con el Director de Diversidad MassDEP a los números de teléfono que aparecen más abajo.

3 Português (Portuguese):
Este documento é importante e deve ser traduzida imediatamente. Se você precisa deste documento traduzido, por favor, entre em contato com Diretor de Diversidade da MassDEP para os números de telefone listados abaixo.

4(a) 中國（傳統）(Chinese (Traditional):
本文件非常重要，應立即翻譯。如果您需要翻譯這份文件，請用下面列出的電話號碼與MassDEP的多樣性總監聯繫。

4(b) 中国（简体中文）(Chinese (Simplified):
本文件非常重要，应立即翻译。如果您需要翻译这份文件，请用下面列出的电话号码与MassDEP的多样性总监联系。

5 Ayisyen (franse kreyòl) (Haitian) (French Creole):
Dokiman sa-a se yon bagay enpòtan epi yo ta dwe tradui imedyatman. Si ou bezwen dokiman sa a tradui, tanpri kontakte Divèsite Direktè MassDEP a nan nimewo telefòn ki nan lis pi ba a.

6 Việt (Vietnamese):
Tài liệu này là rất quan trọng và cần được dịch ngay lập tức. Nếu bạn cần dịch tài liệu này, xin vui lòng liên hệ với Giám đốc MassDEP đa dạng tại các số điện thoại được liệt kê dưới đây.

7 ប្រទេសកម្ពុជា (Kmer (Cambodian):
ឯកសារនេះគឺមានសារៈសំខាន់និងត្រូវត្រូវបានបកប្រែភ្លាម។ ប្រសិនបើអ្នកត្រូវបានបកប្រែ
ឯកសារនេះសូមទំនាក់ទំនងឆ្មោកជានាយក MassDEP នៅលេខទូរស័ព្ទដែលបានរាយខាងក្រោម។

8 Kriolu Kabuverdianu (Cape Verdean):
Es documento é importante e deve ser traduzido imidiatamente. Se bo precisa des documento traduzido, por favor contacta Director de Diversidade na MassDEP's pa es numero indicode li d'boche.

9 Русский язык (Russian):
Этот документ является важным и должно быть переведено сразу. Если вам нужен этот документ переведенный, пожалуйста, свяжитесь с директором разнообразия MassDEP по адресу телефонных номеров, указанных ниже.

10 العربية (Arabic):
هذه الوثيقة الهامة وينبغي أن تترجم على الفور. اذا كنت بحاجة الى هذه الوثيقة المترجمة، يرجى الاتصال مدير التنوع في MassDEPعلى أرقام الهواتف المدرجة أدناه.

11 한국어 (Korean):
이 문서는 중요하고 즉시 번역해야합니다. 당신이 번역이 문서가 필요하면 아래의 전화 번호로 MassDEP의 다양성 감독에 문의하시기 바랍니다.

12 հայերեն (Armenian):
Այս փաստաթուղթը շատ կարեւոր է եւ պետք է թարգմանել անմիջապես. Եթե Ձեզ անհրաժեշտ է այս փաստաթուղթը թարգմանվել դիմել MassDEP բազմազանությունը տնօրեն է հեռախոսահամարների թվարկված են ստորեւ.

13 فارسی (Farsi (Persian):
این سند مهم است و باید فورا ترجمه شده است.
اگر شما نیاز به این سند ترجمه شده، لطفا با ما تماس تنوع مدیر MassDEP در شماره تلفن های ذکر شده در زیر.

14 Français (French):
Ce document est important et devrait être traduit immédiatement. Si vous avez besoin de ce document traduit, s'il vous plaît communiquer avec le directeur de la diversité MassDEP aux numéros de téléphone indiqués ci-dessous.

15 Deutsch (German):
Dieses Dokument ist wichtig und sollte sofort übersetzt werden. Wenn Sie dieses Dokument übersetzt benötigen, wenden Sie sich bitte Diversity Director MassDEP die in den unten aufgeführten Telefonnummern.

16 Ελληνική (Greek):
Το έγγραφο αυτό είναι σημαντικό και θα πρέπει να μεταφραστούν αμέσως. Αν χρειάζεστε αυτό το έγγραφο μεταφράζεται, παρακαλούμε επικοινωνήστε Diversity Director MassDEP κατά τους αριθμούς τηλεφώνου που αναγράφεται πιο κάτω.

17 Italiano (Italian):
Questo documento è importante e dovrebbe essere tradotto immediatamente. Se avete bisogno di questo documento tradotto, si prega di contattare la diversità Direttore di MassDEP ai numeri di telefono elencati di seguito.

18 Język Polski (Polish):
Dokument ten jest ważny i powinien być natychmiast przetłumaczone. Jeśli potrzebujesz tego dokumentu tłumaczone, prosimy o kontakt z Dyrektorem MassDEP w różnorodności na numery telefonów wymienionych poniżej.

19 हिन्दी (Hindi):
यह दस्तावेज महत्वपूर्ण है और तुरंत अनुवाद किया जाना चाहिए. आप अनुवाद इस दस्तावेज़ की जरूरत है, नीचे सूचीबद्ध फोन नंबरों पर MassDEP की विविधता निदेशक से संपर्क करें.

Contact Michelle Waters-Ekanem, Diversity Director/Civil Rights: 617-292-5751 TTY# MassRelay Service1-800-439-2370
http://www.mass.gov/eea/agencies/massdep/service/justice/

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

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Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Matthew A. Beaton
Secretary

Martin Suuberg
Commissioner

May 3, 2019

Christopher Cronin
Town of Andover
Department of Public Works
397 Lowell Street
Andover, MA 01810

RE: ANDOVER – Solid Waste Management
Ledge Road Landfill
Ledge Road
FMF# 269388

BWP SW25 – Corrective Action Design
Transmittal Number: X275420

Approval and Authorization to Construct
FINAL DECISION

Dear Mr. Cronin:

The Massachusetts Department of Environmental Protection, Northeast Regional Office, Bureau of Air and Waste, Solid Waste Management Section (MassDEP or the Department) has reviewed your applications regarding the closure and post-closure use of the Ledge Road Landfill located on Ledge Road in Andover, Massachusetts (the Landfill). The application package was submitted with separate transmittal forms for the proposed Landfill final cover design and the proposed post-closure use (permit category BWP SW25 *Corrective Action Design*, Transmittal Number: X275420, and permit category BWP SW36 *Post-Closure Use-Major*, Transmittal Number: X275730, respectiviely; together, the Application). Given the scope of the proposed activities, MassDEP has reviewed the Application as category BWP SW25 *Corrective Action Design.* Please refer to Transmittal Number: X275420 on all future correspondence regarding the Application.

The Application was prepared and submitted to MassDEP by CDM Smith, Inc. of Boston, Massachusetts (CDM Smith) on behalf of the Town of Andover (the Town). The Application plan set includes 48 drawing sheets where Sheet G-1 provides a list of drawings. The design plans are titled:

Ledge Road Landfill Closure Project
Andover, Massachusetts
March 2017
Last Revised February 6, 2018
Prepared by CDM Smith, Inc.

This information is available in alternate format. Contact Michelle Waters-Ekanem, Director of Diversity/Civil Rights at 617-292-5751.
TTY# MassRelay Service 1-800-439-2370
MassDEP Website: www.mass.gov/dep
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The Landfill property includes inactive recreational fields and an associated parking area, and a DPW storage yard. Wetland areas, including a wet meadow are located at the Landfill within the limits of waste disposal. Additional wetlands are located west of the Landfill and contain arsenic-impacted soil and sediment. As discussed in the Application, the project site is also subject to certain requirements of 310 CMR 40.0000, the Massachusetts Contingency Plan (MCP).[1]

On November 7, 2017, CDM Smith submitted supplemental information regarding the Application in response to comments from MassDEP Wetlands and Waterways Program regarding the proposed wetland replication area at the project site.

On December 14, 2017, MassDEP issued to the Town, a Notice of Technical Deficiency (the NOTD) regarding the Application. On March 19, 2018, CDM Smith submitted supplemental information regarding the Application in response to the NOTD (the NOTD Response).

DISCUSSION

As discussed in the Application, the Town proposes to construct a standard final cover system (cap) to close the Landfill. As designed, the cap will include the following layers (from top to bottom):

- 8-inch topsoil vegetative support layer;
- 12-inch sand drainage layer (including flat panel drains as shown on the design plans);
- 40-mil textured linear low-density polyethylene (LLDPE) flexible membrane liner (FML) lower permeability capping layer; and
- 6-inch sand gas venting layer.

The Application also proposes a new Department of Public Works (DPW) material storage yard to be located on the Landfill cap (the DPW yard). Construction of the DPW yard area will include placement of additional soils, and the installation of storm water management structures, pavement, material bins, retaining walls, and guard rails. The Application includes conceptual design plans and details for the retaining walls to be constructed in the proposed DPW yard area. The final design plans and construction details for retaining walls will be submitted to MassDEP for review and approval prior to construction (refer to Condition 5.d of this decision).

The cap will be protected from potential landfill gas (LFG) pressure by the six-inch gas venting layer that interfaces with twenty six (26) passive LFG vents. The Application proposes to control existing and potential LFG migration with two LFG horizontal vent trenches, located along the northeastern and southern limits of the Landfill, to be constructed as part of the anchor trench for the FML cap. Two existing on-site soil stockpiles and one off-site soil stockpile located at the Town of Andover's Bald Hill Compost site will be further evaluated by CDM to determine the suitability of the soils for use as grading and shaping materials below cap or as common fill above the cap.

[1] Release Tracking Number (RTN): 3-27632.

For the purposes of wetland restoration and landfill gas management, the proposed project includes relocation of waste from areas along the Landfill property boundary, and from areas of proposed wetland restoration. A confirmatory sampling program will be implemented to verify waste removal and to confirm that underlying soils have been removed to applicable cleanup standards. The relocated waste and soils will be placed below the proposed cap.

As part of the corrective action design, wetlands located west (down gradient) of the Landfill were evaluated to identify areas of arsenic-impacted soil and sediment (arsenic evaluation). The arsenic evaluation identified seven wetland "hot spot" areas, where soils contained arsenic concentrations greater than 900 milligrams per kilogram (mg/kg). As proposed, these "hot spot" areas will be remediated by excavating and removing impacted soil and sediment. Confirmatory sampling will be conducted to verify soils with arsenic concentrations greater than 900 mg/kg have been removed. Wetland areas disturbed by remedial activities will be restored. Excavated wetland soil and sediment will be dewatered and disposed on-site under the proposed landfill cap. Wetland restoration will also include removal of an existing paved driveway and a storm water culvert located on Town-owned land adjacent to the Landfill. Wetland restoration work is permitted under a Superseding Order of Conditions, dated April 17, 2018 (MassDEP Wetlands File #90-1281). The U.S. Army Corps of Engineers issued a General Permit for the project dated November 14, 2018.

As proposed in the Application, environmental monitoring at the Landfill will continue during Landfill closure construction in accordance with the existing 2008 Environmental Monitoring Plan, as amended in 2017. The existing (pre-construction) environmental monitoring network consists of the following monitoring locations:

- Eighteen groundwater monitoring well locations with a total of 31 discrete wells;
- Four piezometer locations;
- Ten surface water sampling locations, including raw water influent from the Andover; Water Treatment Plant;
- Six surface water gauging locations; and
- Sixteen temporary landfill gas monitoring probes.

During construction, eight groundwater monitoring wells and two piezometers will be replaced. In addition, three surface water sampling stations and one surface water gauging location will be relocated. Groundwater monitoring wells CDM-2D, MW-5S, TW-1, OW-1 and OW-2, and surface water gauging station SWG-1 will each be decommissioned to either reduce well redundancy or as a result of well proximity to landfill closure construction activities.

The Application includes a draft Post-Closure Maintenance and Monitoring Plan (PCMMP) for the Landfill. The NOTD included initial technical comments on the draft PCMMP. A revised PCMMP will be submitted to MassDEP for review and approval following substantial completion of landfill closure (refer to Condition 5.g of this decision).

The proposed DPW yard for material storage will cover approximately six acres of capped area and will include a paved access road, and a materials laydown area. The design also includes 13 concrete storage bays with asphalt pavement surrounding the storage bunkers. To facilitate material handling and for the control of vehicle traffic, retaining walls will be constructed around and within

portions of the DPW yard area. As proposed, the Application seeks approval of two potential construction designs for the surface of the materials laydown area:

1) Primary Design: A 3.5-inch thick asphalt pavement surface that overlays a layer of crushed stone and gravel base (as shown on Sheets D-2 and C-18); and
2) Alternate Design (as revised): A crushed stone finished surface, with a gravel infiltration trench adjacent to the perimeter access road for storm water management (as shown on Sheets D-1 and C-A). This design eliminates certain catch basins and storm water piping located within the crushed stone area.

The storm water management design includes two storm water basins (north and south) and a replicated wet meadow on the eastern edge of the landfill cap. The wet meadow outlet discharges to the south storm water basin via a swale. Storm water from vegetated cap areas will be directed to storm water ponds via berms and let-down channels. Some storm water will sheet flow to land adjacent to the cap. Storm water from the DPW yard will primarily be managed via storm water catch basins and inline separators that discharge to the storm water basins. On May 15, 2018, MassDEP (Bureau of Water Resources) issued approval of the Water Quality Certification for the project.

A settlement analysis of soil stockpile loading effects on the LLDPE FML cap below the proposed DPW yard at two locations (a retaining wall and the material stockpile area) was submitted as part of the NOTD Response. The analysis found the maximum estimated FML strain resulting from settlement was located near the concrete bay retaining wall at 3.66 percent (less than the LLDPE yield strain of 13 percent). The analysis did not evaluate the effect of settlement on storm water management as related to changes in DPW yard grades and storm water management structures, or stability of the DPW yard retaining walls. To minimize post-construction settlement in the DPW yard, a detailed Pre-loading Plan will be required prior to construction to maximize pre-construction settlement in the DPW yard area (refer to Condition 5.c of this decision).

The Town also proposes to complete storm water management improvements along Greenwood Road as part of the landfill closure project. A portion of the proposed Greenwood Road work (inline separator and sections of storm water piping) will occur off cap and on the Landfill property.

Additional details on the Application and proposed project can be found in the Fact Sheet attached hereto as Attachment 1.

PROVISIONAL DECISION & COMMENT PERIOD

On April 30, 2018, MassDEP issued a Provisional Decision regarding the Application pursuant to 310 CMR 19.033(4)(a) for the purpose of obtaining comment from the Applicant, the Town of Andover, other interested parties, and the public on the proposed decision. The Public Comment Period on the Provisional Decision closed on May 30, 2018.

MassDEP received written comments from the Town and five Town residents (collectively, the Public Comments). MassDEP also received a letter dated November 15, 2018 prepared by CDM

on behalf of the Town providing responses to topics raised in the Public Comments. Copies of the Public Comments received by MassDEP and a copy of the November 15, 2018 letter from CDM Smith are attached to this decision as Attachment 2. MassDEP's Response to Comments is attached to this decision as Attachment 3.

After review of all comments received, MassDEP is issuing this Final Decision on the Application and has made the following change to the Provisional Decision:

- Condition 5.g.v of the decision requires submittal of a maintenance plan for the DPW yard area. The condition was revised to also require a Storm Water Pollution Prevention Plan (SWPPP) for the site that includes, without limitation, procedures for the control and prevention of spills at the DPW yard area.

The Application Review Fact Sheet has also been updated to reflect the Public Comment process.

FINAL DECISION

MassDEP has determined that the Application, as conditioned by this Final Decision and permit, complies with the requirements of 310 CMR 19.000 including, but not limited to, the requirements of 310 CMR 19.105, 310 CMR 19.112, 310 CMR 19.113, 310 CMR 19.143 and, 310 CMR 19.151, subject to the Applicant's compliance with the conditions imposed by MassDEP pursuant to 310 CMR 19.043(1), 310 CMR 19.143(1)(a) and 310 CMR 19.151(3)(a).

This decision is issued pursuant to 310 CMR 19.033 and is an approval of the closure design and post-closure use of the Landfill and an Authorization to Construct (ATC) issued pursuant to M.G.L. Chapter 111, § 150A and 310 CMR 19.000, subject to the conditions set forth below. In the event this approval or ATC conflicts with all or parts of prior plans or approvals issued pursuant to Chapter 111, § 150A, the terms and conditions of this approval and ATC shall supersede the conflicting provisions of the prior approvals. This approval and ATC do not convey property rights of any sort or any exclusive privilege. This decision does not relieve the Town, or any other person, of the responsibility to comply with all other applicable federal, state and local statutes, regulations and requirements.

CONDITIONS

1. This decision is effective upon the date stamped on page one of this decision.

2. The Town shall comply with this permit and the requirements of 310 CMR 19.000, including, but not limited to, the requirements established at 310 CMR 19.043(5), *Standard Conditions*.

3. The Town shall comply with 310 CMR 40.0000, the Massachusetts Contingency Plan including, but not limited to, section 310 CMR 40.0114: *Solid Waste Management Facilities*.

4. All work under this decision shall be completed and conducted under the supervision of an independent Massachusetts Registered Professional Engineer (Engineer of Record) who shall have sufficient qualified staff on-site to provide field supervision and quality assurance/quality control for all construction activities.

5. **Required Submittals**:

   a. PIP Repository: The project site is designated as a Public Involvement Plan (PIP) site pursuant to 310 CMR 40.0114. **Within seven (7) days of the effective date of this decision**, the Town shall submit to MassDEP written confirmation that a complete copy of the revised Application and a copy of this decision have been placed in the PIP repository pursuant to the PIP for the site.

   b. Notification of Construction: **Not less than seven (7) days prior to commencing construction** pursuant to the Application and this decision, the Town shall notify MassDEP and the Town of Andover Board of Health (the BOH) in writing of the scheduled date of the commencement of construction at the site. The construction notification shall include the following:
      i. The projected schedule for completion of the project and major construction milestones;
      ii. The name and contact information for the Engineer of Record for the project;
      iii. The name and contact information of an on-site contact for the project;
      iv. The National Pollutant Discharge Elimination System (NPDES) Notice of Intent and Storm Water Pollution Prevention Plan (SWPPP) for the project; and
      v. A Health and Safety Plan for the project. (Also refer to Condition 6, below.)

   c. Pre-Loading Plan (DPW Yard): **Not less than thirty (30) days prior to commencing construction** pursuant to the Application and this decision, the Town shall submit a Pre-Loading Plan, for MassDEP's review and approval, together with an application, category BWP SW45 – *Alternative Review Process*, for pre-loading certain portions of the DPW yard area that will be susceptible to settlement effects, including retaining walls, storm water management structures, and related grading for storm water management. The Pre-Loading Plan shall include, but is not limited to:
      i. A Soil pre-loading settlement assessment that provides recommended pre-loading soil thickness above the final grades and the duration of pre-loading to maximize settlement prior to construction to account for soils and materials placed during construction and the subsequent storage of soils and materials in the DPW yard; and
      ii. A site plan showing soil pre-loading locations and soil thicknesses above final grade.

   d. Retaining Wall Design Plans and Details: **Not less than thirty (30) days prior to commencing construction of retaining walls** in the DPW yard area pursuant to the Application and this decision, the Town shall notify MassDEP in writing of the scheduled

date of the commencement of construction of the retaining walls. In addition, the Town shall submit the Retaining Wall Design Plans and Details, for MassDEP's review and approval, together with an application, category BWP SW45 – *Alternative Review Process*. The retaining wall design plans and details shall be signed and stamped by a Massachusetts licensed Professional Engineer experienced with retaining wall design.

e. Construction Monitoring Reports: Refer to Condition 14 of this decision regarding the requirements for routine construction monitoring and the submittal of construction monitoring reports.

f. Construction Certification Report: **On or before ninety (90) days after the date of completion of construction**, The Town shall submit for review and approval by MassDEP a construction certification report, as an application category BWP SW43 *Landfill Closure Completion*, as set forth below. The certification report shall include, but is not limited to:
   i. As-built plans for the final as-constructed improvements, prepared by a Massachusetts Registered Professional Engineer, amended to incorporate all modifications and alterations, if any, made during construction;
   ii. A report, prepared by the Massachusetts Registered Professional Engineer of Record, providing all applicable quality control/ quality assurance data and certifying that the closure was completed in conformance with the approved plans and 310 CMR 19.000;
   iii. A copy of the Notice of Landfill Operation, pursuant to 310 CMR 19.141, as recorded in the registry of deeds or in the registry section of the land court for the district wherein the Landfill lies in accordance with M.G.L. c. 111, sec 150A;
   iv. A Post-Closure Monitoring and Maintenance Plan for the Landfill (refer to Condition 5.g, below); and
   v. Certifications by the Town and the Engineer of Record pursuant to 310 CMR 19.011.

g. Post-Closure Monitoring and Maintenance Plan: Together with the Closure Certification Report required above, the Town shall submit a Post-Closure Monitoring and Maintenance Plan for the Landfill (the Post-Closure Plan). The Post-Closure Plan shall be prepared in accordance with 310 CMR 19.000. Without limitation, the Post-Closure Plan shall include:
   i. Schedules and a description of the inspection and maintenance tasks and other activities related to the final cover system, access roads, and the environmental monitoring of the Landfill as outlined in 310 CMR 19.132;
   ii. A site plan drawing showing the ground water, surface water, and landfill gas sampling locations, the property boundaries, and other significant site features;
   iii. Boring and well construction logs for each new monitoring well installed, and all available boring and well construction logs for monitoring wells to remain in the monitoring network;
   iv. A wetlands soils monitoring program to periodically evaluate arsenic concentrations in wetlands soil and sediment; and
   v. A DPW yard maintenance plan that includes:
      1. The tasks and schedule for maintenance of the in-line storm water separator and catch basins; and

2. A survey plan to monitor periodic settlement, including a list of dedicated and easily accessible and identifiable survey benchmarks together with a site plan illustrating the benchmark locations. The survey benchmarks shall include each storm water catch basin, typically accessible pavement areas, and locations above buried storm water pipe. The benchmarks must be surveyed by a Massachusetts licensed Professional Land Surveyor. An initial settlement survey shall be performed after completion of closure construction and before receiving DPW materials to be stockpiled. Additional surveys shall be conducted once each calendar year for two years following approval of the Closure Certification Report, and a minimum of once every two years thereafter. Results of each settlement survey shall be included in the landfill operation and maintenance third-party inspection report prepared and submitted in accordance with 310 CMR 19.018 and Condition 19 of this decision.
3. A Storm Water Pollution Prevention Plan (SWPPP) for the site including, without limitation, procedures for the control and prevention of spills at the DPW yard area.

6. The Town shall ensure that all necessary actions are taken to protect the health and safety of workers and the general public during the project. The ambient air shall be monitored for volatile organic compounds (VOCs) and methane, and the observations of said monitoring shall be documented. A Health and Safety Plan for the project shall be developed and submitted to MassDEP, for the facility file that includes, but is not limited to:
   a. protocols for monitoring for landfill gas (methane, hydrogen sulfide, etc.), as needed;
   b. protocols for modifying work practices if landfill gas is detected at levels of concern (action levels);
   c. instruction and training of all personnel working on the site regarding the potential health and safety hazards at the Landfill including, but not limited to, those associated with landfill gas; and
   d. instruction and training of all personnel in compliance with the conditions of this permit and how to perform authorized activities in a manner that is not hazardous to public health, safety, and the environment.

7. The Town shall instruct all contractors and employees in the requirements of this permit, as applicable to their work. The Town shall maintain and make available at the Landfill a copy of this decision and all approved plans, appendices, protocols and attachments for use by the Town's contractors and employees. The Town shall maintain records at the site to document that all contractors and employees have been instructed pursuant to this condition. The Town shall ensure that all work performed at the Landfill complies with 310 CMR 19.000 and the applicable requirements of this permit.

8. All disturbance of the Landfill shall be limited to the proposed excavations and installations as depicted and described in the Application and the approved plans and this permit. Any additional activities or modifications not described in the Application, Transmittal Number:

X275420, may require notification of MassDEP, and the preparation and submittal of a separate application for permit modification. No changes, modifications or alterations shall be made to the approved plans, unless otherwise approved, in writing, by the Department in accordance with 310 CMR 19.000.

9. At the conclusion of each day, all exposed waste materials shall be covered with a minimum of six (6) inches of clean soil or a tarp. All areas disturbed during construction shall be stabilized as soon as possible upon completion of construction work in each work area.

10. Maintenance of slopes, berm(s), drainage swales, storm water systems, outlet structures, and appurtenances shall be performed to keep these structures in good working order. The area around the site entrance shall be maintained in a condition which shall prevent tracking of sediment onto adjacent public roads or existing onsite pavement. All sediment spilled, dropped, washed or tracked onto adjacent public roads or existing onsite pavement shall be removed without delay.

11. The Town shall implement all measures necessary to prevent, minimize and mitigate the generation and emission of dust wherever and whenever necessary at the Landfill and any other areas related to or under the control of the Town to prevent fugitive dust emissions and/or the occurrence of nuisance conditions. Water shall not be used for dust control in amounts that produce excessive infiltration, ponding, runoff or erosion.

12. The Town shall implement the measures necessary to control and manage storm water at the site including, without limitation, implementation of a Storm Water Pollution Prevention Plan for the Property that complies with applicable MassDEP regulations and guidelines. The Town shall periodically evaluate the general site conditions to assess the effectiveness of sediment and erosion control measures and determine whether additional measures are needed to prevent erosion and sedimentation. In addition, this approval does not relieve the Town or any other person of the responsibility to comply with the National Pollutant Discharge Elimination System (NPDES) requirements including, without limitation, the applicable NPDES permit requirements for *Discharges from Construction Activities*, as applicable to the construction activities approved by this permit.

13. The Town shall perform routine construction monitoring of the Landfill in accordance with the requirements of this Section and the approved plans to ensure compliance with this permit and the approved plans. The routine monitoring shall include, without limitation:

    a. Daily inspection and assessment of the status and condition of the Landfill[2] and construction activities. This shall include, but not be limited to, the monitoring of the site for the occurrence of nuisance odors, dust, and noise, and storm water run-off from the site and any necessary corrective actions.

[2] This includes but is not limited to structures, equipment, devices, storm water management controls, environmental control systems, paved surfaces, fencing, gates, and other areas.

b. Maintenance at the site of a Daily Construction Activity Log that includes, but is not limited to:

   i. A daily summary that describes, without limitation, the principle activities at the Landfill that day such as, site grading, excavation, storm water system maintenance, and notable construction milestones;

   ii. A description of any deviations from the approved plans, this decision and ATC;

   iii. A description of corrective actions, maintenance, or repairs taken, or to be taken, to mitigate or correct problems, damage from natural occurrences such as significant precipitation events, or potential/actual nuisance conditions;

   iv. Documentation of all reporting/notifications made to MassDEP, BOH, and other authorities/agencies/emergency responders/facilities, as necessary, in accordance with the Notification Requirements of Condition 16 of this decision; and

   v. Documentation of any complaints received by the Town relative to the activities at the Landfill that includes, but is not limited to the name/identity of the complainant and the complainant's contact information (if provided to the Town), the date and time of the complaint, the nature of the complaint, and the response to the complaint including any actions taken by the Town.

14. The Town shall engage the services of an independent Massachusetts registered professional engineer in good standing, qualified and experienced in the design and construction of solid waste management facilities (the Engineer of Record) to oversee all construction activities at the Landfill pursuant to this decision. The Engineer of Record or his/her qualified direct employee[3] (the Inspector) shall conduct routine inspections of the Landfill, construction activities and project status as set forth below. These inspections are not in lieu of any other inspections, oversight or reporting required or necessary to oversee construction activities at the Landfill.

   a. The Inspector shall have adequate training, knowledge and understanding of all applicable regulations, and the requirements of this decision.

   b. The Inspector shall during each inspection thoroughly evaluate the project status and identify actual or potential deviations from the applicable regulations and the requirements of this decision, including, without limitation, all applicable plans and approvals.

   c. The Inspector shall conduct at a minimum, the following inspections of the Landfill and construction activities. These inspections are in addition to those required to direct, monitor, and document the construction activities at the Landfill to prepare the construction certification(s).

[3] For purposes of this decision "qualified direct employee" means an individual, qualified and knowledgeable in the construction of solid waste facilities, employed by and directly responsible to the Engineer of Record and not the Permittee.

i. An initial inspection (the Pre-Construction Inspection) prior to the commencement of construction activities at the Facility to document the pre-construction conditions at the Landfill;

ii. An inspection within seven (7) days of commencement of construction activities and thereafter a minimum of one (1) inspection monthly until the construction of the Landfill modifications are complete;

iii. An inspection within two (2) days after each precipitation event with rainfall greater than 1 inch in a 24-hour period to evaluate the site conditions and status of the erosion and sediment controls. During each such inspection, the inspector shall assess whether additional measures are needed to prevent erosion and sedimentation, and shall document, without limitation, any impacts to the project area, the final cover system, or the storm water management system. In the event any damage is observed or repairs are necessary regarding the erosion and sediment controls, the final cover or the storm water management system, or if sediment enters the storm water drainage system or adjacent wetland resource areas, the Town shall submit a corrective action plan within seven (7) days for MassDEP review and approval that documents the impacts and outlines any proposed repairs. The action plan shall discuss any proposed improvements to the erosion and sediment control and/or Landfill closure design and include revised design plans as necessary, together with a schedule for implementing such repairs and improvements; and

iv. A final inspection within seven (7) days following completion of construction, as approved by this permit and other applicable plans and approvals, to document the post-construction conditions of the Landfill (the Post-Construction Inspection).

d. The Inspector shall prepare written monthly construction monitoring reports of each inspection, as set forth in this Condition (the Construction Monitoring Reports). The results of inspections following precipitation events greater than 1 inch over a 24-hour period shall be included in the monthly Construction Monitoring Report. The Engineer of Record shall submit printed and electronic copies of the monthly Construction Monitoring Report to MassDEP no later than the 15th day of the following month. The Construction Monitoring Reports are in addition to, and shall not substitute for, any other notification(s) which are required by Condition 16 of this decision or any other applicable state, federal, or local law or regulation. Copies of each Construction Monitoring Report shall be provided to the Board of Health in such manner as may be prescribed by the Board of Health. A copy of each Construction Monitoring Report shall also be made available at the Landfill for review by authorized representatives of MassDEP and the Town, upon request. Each Construction Monitoring Report shall be signed, dated, and certified in accordance with 310 CMR 19.011(1) by the Inspector and the Engineer of Record and shall, without limitation:

i. Document the conditions and construction activities at the time of the inspection and the project progress since the previous inspection;[4]

[4] As examples, depending on the project phase, the Construction Monitoring Report may document: site preparation activities, installation and maintenance of erosion and sediment controls, excavation,

ii. Identify any actual or potential deviations from the applicable regulations, the requirements of this permit, and all applicable plans and approvals; and

iii. In the event a condition of actual or potential deviation is identified, the Construction Monitoring Report shall:

- describe the deviation/issue;
- identify the action(s) the Town took or intends to take to correct the deviation/issue and a schedule for taking the action(s); and
- include photographs documenting the condition of the Landfill and construction progress.

15. The Town shall, within fourteen (14) days of the date of receiving written comments from MassDEP[5] on a Construction Monitoring Report, provide a written response to MassDEP that includes any information that MassDEP reasonably requires. This provision does not limit MassDEP's right to request information pursuant to 310 CMR 19.000, 310 CMR 40.0000, the Massachusetts Contingency Plan (the "MCP"), and 310 CMR 30.000, the Massachusetts Hazardous Waste Regulations or any other applicable state, federal, or local law or regulation.

16. The Town shall comply with the notifications described in this permit and 310 CMR 19.043(5)(i), *Duty to Inform*. These notifications are in addition to, and shall not substitute for, any other notification(s) which are required pursuant to 310 CMR 40.0000, the Massachusetts Contingency Plan (the MCP), and 310 CMR 30.000, the Massachusetts Hazardous Waste Regulations or any other applicable state, federal, or local law or regulation.

a. The Town shall notify MassDEP and the Board of Health within twenty-four (24) hours whenever possible, but in no event later than forty-eight (48) hours of the Town, Engineer of Record or contractor(s), becoming aware of :

i. The occurrence of any conditions or events at the Landfill that result in off-site nuisance conditions or a threat to the public health, safety, welfare or the environment;

ii. The details of any incidents that resulted in the response of emergency personnel (fire, police, MassDEP Emergency Response personnel, the Occupational Health and Safety Administration, etc.) to the Landfill; and

iii. The receipt by the Town of any complaint of off-site nuisance conditions attributed to the Landfill.

b. This written notification shall be made by FAX to MassDEP's Solid Waste Management Section, Northeast Regional Office at (978) 694-3499 or by email to Mark.Fairbrother@mass.gov. If a FAX or email is not available, the notification may be

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foundation/footing installations, drainage and utility installations, building construction work, and site stabilization, grading, and associated paving and landscaping activities, etc.

[5] MassDEP may at its sole discretion upon request of the Permittee extend the fourteen (14) day time period for responding to MassDEP's comments.

made by telephone to (978) 694-3298. Such notification by telephone shall be followed up by a certified letter within seven (7) days.

c. This notice shall, at a minimum, include a description of the incident and/or complaint, the impact on the construction activities authorized by this approval and ATC, and a description of any corrective actions the Town has taken or intends to take to minimize the potential for a recurrence.

17. Where the design specifications provide a standard as "minimum" or "maximum" (or other of similar effect) the closure certification shall document that all material accepted and placed for that use either equals the standard, or the material exceeds or is below the standard, respectively. Where materials are received that do not meet one or more standards the closure completion certification report shall clearly document either that the material was rejected and not used, or was modified or otherwise processed, so as to meet the standard(s) as actually used. Where an area must be reworked, repaired or otherwise removed and replaced, confirmatory testing shall be completed and documented showing that the reworked, repaired and/or replaced materials meet specifications. The thickness of the soil/separation layers shall include documentation by direct tabulated measurement that the layer meets the specifications. Testing results and measurements shall not be averaged to determine compliance with the specifications.

18. The Town shall decommission groundwater monitoring wells CDM-2D, MW-5S, TW-1, OW-1 and OW-2, and surface water gauging station SWG-1 in accordance with this decision. Groundwater monitoring wells shall be constructed and decommissioned in accordance with the Department's guidance document #WSC-310-91: Standard References for Monitoring Wells (Standard References). Such installation and decommissioning shall be documented in the Closure Certification Report prepared pursuant to Condition 5.f of this decision.

19. The Landfill final cover system shall be inspected by a qualified third-party inspector, as part of the third-party landfill inspection for the entire Landfill, in accordance with the requirements provided in 310 CMR 19.018. The inspection shall include, but is not limited to, the integrity and condition of the cap, the storm water management system and the environmental monitoring network.

20. The submittals to MassDEP required by this decision shall be submitted by the Town in accordance with the applicable provisions of 310 CMR 4.00, *Timely Action Schedule and Fee Provisions*. In the event that MassDEP provides written comments to the Town on documents submitted pursuant to this paragraph, the Town shall provide a response and revised document to MassDEP within twenty-one (21) days of the date of MassDEP's written comments that corrects any deficiencies reasonably identified by MassDEP in the document(s)[6] and; makes any changes that MassDEP reasonably requires.

[6] Such documents include but are not limited to Notice of Administrative or Technical Deficiency issued pursuant to 310 CMR 4.00.

21. MassDEP reserves the right to rescind, suspend or modify this approval based upon a determination that the project causes the development of nuisance conditions, is not being operated safely or in accordance with this approval, or results in a threat to the public health, safety or the environment.

22. Pursuant to 310 CMR 19.041(4), *Sunset*, this approval shall expire if the activities approved by this permit are not completed on or before three years from the effective date. The Applicant may apply for and MassDEP may, at its sole discretion, grant an extension of this approval.

NOTICE OF RIGHT TO APPEAL

Appeal. Any person aggrieved by the issuance of this decision, except as provided for under 310 CMR 19.033(4)(b), may file an appeal for judicial review of said decision in accordance with the provisions of M.G.L. c. 111, s. 150A, and M.G.L. c. 30A, not later than thirty (30) days following the receipt of the final decision. The standing of a person to file an appeal and the procedures for filing such appeal shall be governed by the provisions of M.G.L. c. 30A. Unless the person requesting an appeal requests and is granted a stay of the terms and conditions of the decision by a court of competent jurisdiction, the decision shall remain effective.

Notice of Action. Any aggrieved person intending to appeal this decision to the Superior Court shall first provide notice to the Department of their intention to commence such action. Said notice of intention shall include the Department file number and shall identify with particularity the issues and reasons why it is believed the decision was not proper. Such notice shall be provided to the Office of General Counsel of the Department and the Regional Director for the regional office which processed the application. The appropriate addresses to which to send such notices are:

General Counsel
Department of Environmental Protection
One Winter Street - 3rd Floor
Boston, MA 02108

and

Eric Worrall
Regional Director
Department of Environmental Protection
205B Lowell Street
Wilmington, MA 01887

No allegation shall be made in any judicial appeal of this decision unless the matter complained of was raised at the appropriate point in the administrative review procedures established in those regulations, provided that a matter may be raised upon a showing that it is material and that it was not reasonably possible with due diligence to have been raised during such procedures or that matter sought to be raised is of critical importance to the environmental impact of the permitted activity.

If you have any questions regarding this matter, please contact Richard Spieler at (978) 694-3317.

Sincerely,

Mark G. Fairbrother
Section Chief
Solid Waste Management

Richard Spieler
Environmental Engineer
Solid Waste Management

MGF/RJS/rjs

Attachment 1: Application Review Fact Sheet, Transmittal Number: X275703
Attachment 2: Public Comments
Attachment 3: MassDEP Response to Comments

Enclosure: Communication for Non-English Speaking Parties

cc: Susan Ruch, Deputy Regional Director, MassDEP-NERO, Bureau of Air and Waste
Email: susan.ruch@state.ma.us

Thomas Carbone
Andover Board of Health
Town Offices
36 Bartlet Street
Andover, MA 01810
Email: health@andoverma.gov

Andrew Miller (CDM Smith, Inc.)
Email: MillerA@cdmsmith.com

Nathan Jones (CDM Smith, Inc.)
Email: JonesNE@cdmsmith.com

Bruce Haskell (Langdon Environmental, LLC)
Email: bhaskell@langdonenv.com

Lawrence Board of Health
200 Common Street
Basement Room 107
Lawrence, MA 01840

Phil DiPietro, MassDEP-NERO/BWR

Karen Stromberg, MassDEP-NERO/BWSC

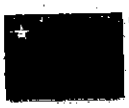
Massachusetts Department of Environmental Protection
One Winter Street, Boston MA 02108 • Phone: 617-292-5751

Communication For Non-English Speaking Parties - 310 CMR 1.03(5)(a)

1 English:
This document is important and should be translated immediately. If you need this document translated, please contact MassDEP's Diversity Director at the telephone numbers listed below.

2 Español (Spanish):
Este documento es importante y debe ser traducido inmediatamente. Si necesita este documento traducido, por favor póngase en contacto con el Director de Diversidad MassDEP a los números de teléfono que aparecen más abajo.

3 Português (Portuguese):
Este documento é importante e deve ser traduzida imediatamente. Se você precisa deste documento traduzido, por favor, entre em contato com Diretor de Diversidade da MassDEP para os números de telefone listados abaixo.



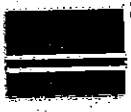
4(a) 中國（傳統）(Chinese (Traditional):
本文件非常重要，應立即翻譯。如果您需要翻譯這份文件，請用下面列出的電話號碼與MassDEP的多樣性總監聯繫。

4(b) 中国（简体中文）(Chinese (Simplified):
本文件非常重要，应立即翻译。如果您需要翻译这份文件，请用下面列出的电话号码与MassDEP的多样性总监联系。

5 Ayisyen (franse kreyòl) (Haitian) (French Creole):
Dokiman sa-a se yon bagay enpòtan epi yo ta dwe tradui imedyatman. Si ou bezwen dokiman sa a tradui, tanpri kontakte Divèsite Direktè MassDEP a nan nimewo telefòn ki nan lis pi ba a.

6 Việt (Vietnamese):
Tài liệu này là rất quan trọng và cần được dịch ngay lập tức. Nếu bạn cần dịch tài liệu này, xin vui lòng liên hệ với Giám đốc MassDEP đa dạng tại các số điện thoại được liệt kê dưới đây.

7 ប្រទេសកម្ពុជា (Kmer (Cambodian):
ឯកសារនេះគឺមានសារៈសំខាន់និងគួរត្រូវបានបកប្រែភ្លាម។ ប្រសិនបើអ្នកត្រូវបានបកប្រែ ឯកសារនេះសូមទំនាក់ទំនងផ្នែកជានាយក MassDEP នៅលេខទូរស័ព្ទដែលបានរាយខាងក្រោម។



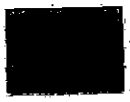
8 Kriolu Kabuverdianu (Cape Verdean):
Es documento é importante e deve ser traduzido imidiatamente. Se bo precisa des documento traduzido, por favor contacta Director de Diversidade na MassDEP's pa es numero indicode li d'boche.

9 Русский язык (Russian):
Этот документ должен быть немедленно. Если вам нужна помощь при переводе, свяжитесь пожалуйста с директором по этике и разнообразие в MassDEP по телефону указанному ниже.

Contact Michelle Waters-Ekanem, Diversity Director/Civil Rights: 617-292-5751 TTY# MassRelay Service 1-800-439-2370. http://www.mass.gov/eea/agencies/massdep/service/justice/
(Version 11.21.17)

10 العربية **(Arabic):**
هذه الوثيقة الهامة وينبغي أن تترجم على الفور. اذا كنت بحاجة الى هذه الوثيقة المترجمة، يرجى الاتصال مدير التنوع في MassDEPعلى أرقام الهواتف المدرجة أدناه.

11 한국어 **(Korean):**
이 문서는 중요하고 즉시 번역해야합니다. 당신이 번역이 문서가 필요하면 아래의 전화 번호로 MassDEP의 다양성 감독에 문의하시기 바랍니다.



12 հայերեն **(Armenian):**
Այս փաստաթուղթը շատ կարեւոր է եւ պետք է թարգմանել անմիջապես. Եթե Ձեզ անհրաժեշտ է այս փաստաթուղթը թարգմանվել դիմել MassDEP բազմազանությունը տնօրեն է հեռախոսահամարների թվարկված են ստորեւ.

13 فارسی **(Farsi [Persian]):**
این سند مهم است و باید فورا ترجمه شده است.
اگر شما نیاز به این سند ترجمه شده، لطفا با ما تماس تنوع مدیر MassDEP در شماره تلفن های ذکر شده در زیر.

14 Français (French):
Ce document est important et devrait être traduit immédiatement. Si vous avez besoin de ce document traduit, s'il vous plaît communiquer avec le directeur de la diversité MassDEP aux numéros de téléphone indiqués ci-dessous.

15 Deutsch (German):
Dieses Dokument ist wichtig und sollte sofort übersetzt werden. Wenn Sie die Übersetzung von diesem Dokument benötigen, wenden Sie sich bitte bei der/dem Diversity Director MassDEP an die unten aufgeführte Telefonnummer.

16 Ελληνική (Greek):
Το έγγραφο αυτό είναι σημαντικό και θα πρέπει να μεταφραστούν αμέσως. Αν χρειάζεστε αυτό το έγγραφο μεταφράζεται, παρακαλούμε επικοινωνήστε Diversity Director MassDEP κατά τους αριθμούς τηλεφώνου που αναγράφεται πιο κάτω.

17 Italiano (Italian):
Questo documento è importante e dovrebbe essere tradotto immediatamente. Se avete bisogno di questo documento tradotto, si prega di contattare la diversità Direttore di MassDEP ai numeri di telefono elencati di seguito.

18 Język Polski (Polish):
Dokument ten jest ważny i powinien być natychmiast przetłumaczone. Jeśli potrzebujesz tego dokumentu tłumaczone, prosimy o kontakt z Dyrektorem MassDEP w różnorodności na numery telefonów wymienionych poniżej.

19 हिन्दी **(Hindi):**
यह दस्तावेज महत्वपूर्ण है और तुरंत अनुवाद किया जाना चाहिए. आप अनुवाद इस दस्तावेज़ की जरूरत है, नीचे सूचीबद्ध फोन नंबरों पर MassDEP की विविधता निदेशक से संपर्क करें.

ATTACHMENT 1

Application Review Fact Sheet
Transmittal Number: X275420

May 3, 2019

FACT SHEET
ANDOVER—Ledge Road Landfill
Corrective Action Design/Post-Closure Use
Final Decision (May 2019)

Facility Identification

Facility:	Ledge Road Landfill
Address:	Ledge Road Andover, MA
Owner/operator:	Town of Andover Department of Public Works
Address:	397 Lowell Street Andover, MA 01810
Facility Number:	269388[1]
Regulated Object Number:	172286

Location[2]: 42^0 40' 16" North Latitude 71^0 11' 27" West Longitude
MSPCS: 225,342 mE 935,660 mN Mainland Zone NAD 83
UTM: 320,473 mE 4,726,620 mN Zone 19

Size of site:	25.8 acres
Waste disposal area:	Approximately 23 acres
Capacity:	Closed to receipt of waste
Type of waste:	Municipal Solid Waste, yard waste

Current Application

Type:	Corrective Action Design (BWP SW25) Transmittal Number: X275420 Date: June 30, 2017 Prepared by: CDM Smith, Inc. Engineer of Record: Andrew B. Miller, PE
Applicant:	Town of Andover Department of Public Works 397 Lowell Street Andover, MA 01810

[1] Formerly Facility Number: 39026.
[2] For reference only. Estimated by MassDEP from MassGIS.

Report: Town of Andover, Massachusetts
Ledge Road Landfill Closure Project
Dated: June 30, 2017

Plans: Town of Andover, Massachusetts
Ledge Landfill, Landfill Closure Project (48 Sheets)
March 2017
Revised April 26, 2017
Revised June 27, 2017
Revised November 3, 2017
Revised February 6, 2017

Supplemental Information:

Response to Comments: Proposed Wetland Replication
CDM Smith, Inc.
Dated: November 7, 2017

Response to Notice of Technical Deficiency
CDM Smith, Inc.
Dated: March 16, 2018

MEPA: Environmental Notification Form
MEPA # 13514
Secretary's Certificate: May 23, 2005
No Environmental Impact Report (EIR) required.

Other Permits/Submittals Relative to this Application:

Location to be Investigated (LTBI)
RTN: 3-1625
LSP opinion: Adequately Regulated Solid Waste Facility; August 2, 1995

Comprehensive Site Assessment (BWPSW23)
Transmittal # W008778
Approved: July 21, 2001

Public Involvement Plan (PIP)
Corrective Actions at Ledge Road Landfill
RTN: 3-1625
Town of Andover
July 2006

Corrective Action Design (BWP SW25)
Ledge Road Landfill Closure – Phase 1
Transmittal # W105773
October 2007
Amended: July 24, 2008
Approved: August 26, 2008

Imminent Hazard Evaluation
RTN: 3-27632
Dated: April 15, 2008

Supplemental Comprehensive Site Assessment
Arsenic Investigation
Transmittal # none
Dated: September 2008

Corrective Action Alternatives Analysis, Scope of Work (BWP SW45)
Transmittal # X240345
October 12, 2011
Supplemental Information: January 6, 2012

Corrective Action Alternatives Analysis (BWP SW24)
Transmittal # X234306
Dated: February 6, 2012

Corrective Action Planning Activities (BWP SW22)
Transmittal # X234306

Discussion

Between circa 1946 and 1972 the Town operated a landfill for the disposal of municipal solid wastes ("MSW") off Ledge Road in Andover, Massachusetts (the "Landfill"). Following the termination of disposal of MSW, the landfill continued operating for the disposal of leaves, brush and grass clippings (i.e. yard waste). The waste materials were subsequently covered by various types of soil; however, a landfill cap was not completed.

The northern portion of the Landfill was developed as athletic playing fields (now inactive). The Town of Andover Department of Public Works (the "DPW") uses the southern portion of the Landfill for the stockpiling and processing of brush, street sweepings, catch basin cleanings, and other material generated by the DPW.

The Landfill is located within the Merrimack River Basin at the upper drainage boundary of the Fish Brook drainage area. Surface water and groundwater flows from the Landfill into the wetland and two unnamed intermittent streams that abut the Landfill to the southwest and from there to Fish Brook. Fish Brook then flows to the northwest into the Merrimack River. The Town of Andover

operates a surface water pump station on Fish Brook at its confluence with the Merrimack River. As a result, Fish Brook and the upgradient surface waters and wetlands are classified as a Class A Surface Water Source and Outstanding Resource Water ("ORW").

The Town has been conducting an ongoing comprehensive environmental assessment of the Landfill in accordance with 310 CMR 19.150. Arsenic and iron have been detected at concentrations of concern in the groundwater, surface water, and wetland sediments down gradient of the Landfill. This includes the presence of iron staining and flocculent within the wetlands.

In 2008, after the detection of elevated arsenic concentrations in the wetland sediment downgradient of the landfill, the Site was assigned Release Tracking Number ("RTN") 3-27632 and the Town conducted an Imminent Hazard evaluation in accordance with 310 CMR 40.0955 of the Massachusetts Contingency Plan ("MCP"). As a result, the Town developed and implemented an Immediate Response Action ("IRA") Plan that required installation of no trespassing signs around the Landfill, additional fencing to limit access from the playing fields, and several locked gates to prevent vehicular access to the Landfill and surrounding areas.

Corrective Action Alternative Analysis

On February 6, 2012, the Town submitted *Corrective Action Alternative Analysis* prepared by CDM Smith, Inc. ("CDM"), that proposed and evaluated a number of corrective action alternatives for capping the Landfill and addressing the arsenic and iron contamination in the groundwater, surface water, and wetlands. The CAAA recommended, without limitation:

- Placement of an alternative low permeability soil cap on the Landfill;
- Installation of a groundwater collection trench along the downgradient edge of the Landfill coupled with an aeration/settling pond and wetland treatment system to prevent the discharge of groundwater containing elevated concentrations of arsenic and iron to the downgradient wetlands;
- The removal and off-site disposal of wetland sediments downgradient of the Landfill that contain greater than 900 mg/kg of arsenic;
- Access restrictions (fencing, signs, etc.); and
- Post-closure monitoring and inspection.

MassDEP approved the CAAA on May 9, 2012. However, based on the results of environmental assessment and field sampling, it was determined that additional field investigations and sampling were necessary to further delineate the degree and extent of arsenic contamination at and surrounding the Landfill.

Supplemental Investigations

The supplemental investigations included, but were not limited to:

- Installation of 18 additional monitoring wells at multiple depths in both overburden and bedrock;
- Installation of a 6-inch diameter test well and performance of a 48-hour pumping test;
- Three rounds of bench-scale treatability testing on groundwater samples;
- Continued landfill gas and water quality monitoring.

CDM determined during the supplemental investigations that:

- The arsenic and iron plume in the groundwater follows the regional surface water/wetland flow to the southeast;
- The occurrence of arsenic at a concentration of greater than 10 ug/l (the Massachusetts Drinking Water Standard) is limited to an area east of Interstate Route 93 that extends 750 feet from the Landfill; and
- The presence of 1,4-dioxane had been detected in groundwater at the Landfill in concentrations ranging from 2 to 22 ug/L above the Massachusetts drinking water guideline for 1,4-dioxane of 0.3 ug/L.

The supplemental investigations confirmed the original conceptual site model that the landfilled waste is located within the vertical limit of the groundwater table, creating chemically reducing conditions. These conditions can contribute to the mobilization of arsenic and iron.

Precipitation and surface water infiltration through landfilled waste can also contribute to the reducing conditions beneath the landfill and the mobilization of the arsenic and iron. When groundwater discharges to the surface water and the wetlands, oxidizing conditions occur and the arsenic and iron may co-precipitate and be deposited onto downgradient wetland sediments.

Groundwater Treatability Studies

CDM performed three treatability studies to evaluate the treatment train proposed in the CAAA to remove the arsenic and iron from the groundwater prior to its discharge into the surface water and wetland. CDM concluded that the removal of the arsenic from the groundwater cannot be achieved by aeration/settling as proposed in the CAAA.

The addition of hydrogen peroxide is required to remove the arsenic to meet the anticipated NPDES standards for discharge of the treated groundwater into the ORW. CDM also concludes that the addition of hydrogen peroxide to the groundwater treatment train requires the addition of a coagulant.

CDM also evaluated the impact of 1,4-dioxane on the groundwater treatment process. CDM states that the complex oxidation process required for treatment of 1,4-dioxane must occur after the removal of the arsenic and iron and the quality of the water from the settlement pond (post-removal) may not be adequate for UV treatment and further modification of the treatment train would be required to address this issue.

Recommended Corrective Actions

Based on the results of additional investigation and assessment, CDM has recommended the following updated corrective actions for the Landfill.

1. *Standard HDPE Cap with Passive Landfill Gas System*: Replace the alternative soil cap proposed and approved in the CAAA with a standard MassDEP solid waste (FML cap to eliminate infiltration through the landfill surface to the maximum extent, with the intended goal of lowering the water table below the vertical limits of the waste.

2. *Monitoring of the Groundwater, Surface Water, and Wetland Areas*: Continued monitoring of the groundwater, surface water, and wetland resource areas to assess the effectiveness of the capping and determine whether additional remediation of the groundwater is required.
3. *Impacted Wetland Sediment Removal:* The excavation and removal of approximately 0.5 acres of arsenic-impacted sediments in excess of 900 mg/kg from the nearby wetland area to achieve a Condition of No Significant Risk, as defined under the MCP. The excavated sediment would be relocated to the Landfill below the HDPE cap and the wetlands will be replicated.
4. *Institutional and Engineering Controls:* The implementation of institutional and engineering controls that include, but are not limited to, the acquisition of adjacent impacted parcels with the required deed notices and restrictions pursuant to 310 CMR 19.000 and consistent with the MCP.

MassDEP approved the revised CAAA on June 19, 2015.

Corrective Action Design

As discussed in the Application, the Town proposes to construct a standard final cover system (cap) the Landfill. As designed, the cap will include the following layers (from top to bottom):

- 8-inch topsoil vegetative support layer;
- 12-inch sand drainage layer (including flat panel drains as shown on the design plans);
- 40-mil textured linear low-density polyethylene (LLDPE) flexible membrane liner (FML) as the lower permeability capping layer; and
- 6-inch sand gas venting layer.

The Application also proposes a new Department of Public Works (DPW) material storage yard to be located on the Landfill cap (the DPW yard). Construction of the DPW yard area will include placement of additional soils, and the installation of storm water management structures, pavement, material bins, retaining walls, and guard rails. The Application includes conceptual design plans and details for the retaining walls to be constructed in the proposed DPW yard area. The final design plans and construction details for retaining walls will be required prior to construction (refer to Condition 5.d of the decision).

A six-inch gas venting layer together with twenty-six (26) passive landfill gas vents are included in the design for the management of potential landfill gas (LFG). The Application also proposes to control existing and potential LFG migration with two horizontal vent trenches, located along the northeastern and southern limits of the Landfill, to be constructed as part of the anchor trench for the FML cap.

Two existing on-site soil stockpiles and one off-site soil stockpile located at the Town of Andover's Bald Hill Compost site will be further evaluated by CDM to determine the suitability of the soils for use as grading and shaping materials below cap or common fill above the cap.

For the purposes of wetland restoration and landfill gas management, the project includes relocation of waste from areas along the Landfill property boundary, and from areas of proposed wetland restoration. A confirmatory sampling program will be implemented to verify waste removal and to confirm that underlying soils have been removed to applicable cleanup standards. The excavated waste and soils will be placed in the Landfill below the proposed cap.

As part of the corrective action design, wetlands located west (down gradient) of the Landfill were evaluated to identify areas of arsenic-impacted soil and sediment (arsenic evaluation). The arsenic evaluation identified seven wetland "hot spot" areas, where soils contained arsenic concentrations greater than 900 milligrams per kilogram (mg/kg). As proposed, these "hot spot" areas will be remediated by excavating and removing impacted soil and sediment. Confirmatory sampling will be conducted to verify soils with arsenic concentrations greater than 900 mg/kg have been removed. Wetland areas disturbed by remedial activities will be restored. Excavated wetland soil and sediment will be dewatered and disposed on-site under the proposed landfill cap. Wetland restoration will also include removal of an existing paved driveway and a storm water culvert located on Town-owned land adjacent to the Landfill. Wetland restoration work is permitted under a Superseding Order of Conditions, dated April 17, 2018 (MassDEP Wetlands File #90-1281). The U.S. Army Corps of Engineers issued a General Permit for the project dated November 14, 2018.

As proposed in the Application, environmental monitoring at the Landfill will continue during Landfill closure construction in accordance with the existing 2008 Environmental Monitoring Plan, as amended in 2017. The existing (pre-construction) environmental monitoring network consists of the following monitoring locations:

- Eighteen groundwater monitoring well locations with a total of 31 discrete wells;
- Four piezometer locations;
- Ten surface water sampling locations, including raw water influent from the Andover; Water Treatment Plant;
- Six surface water gauging locations; and
- Sixteen temporary landfill gas monitoring probes.

During construction, eight groundwater monitoring wells and two piezometers will be replaced. In addition, three surface water sampling stations and one surface water gauging location will be relocated. Groundwater monitoring wells CDM-2D, MW-5S, TW-1, OW-1 and OW-2, and surface water gauging station SWG-1 will each be decommissioned to either reduce well redundancy or as a result of well proximity to landfill closure construction activities.

The Application includes a draft Post-Closure Maintenance and Monitoring Plan (PCMMP) for the Landfill. The NOTD included initial technical comments on the draft PCMMP. A revised PCMMP will be submitted to MassDEP for review and approval following substantial completion of landfill closure.

The NOTD Response addressed the draft PCMMP initial technical comments and stated that groundwater monitoring wells MW-4M and MW-9S and surface water monitoring locations

SW-4, SW-24, and WTP, that were proposed to be decommissioned, will remain in the post-closure monitoring network. As part of closure, a series of permanent landfill gas monitoring wells will be installed along the northeastern and southeastern perimeter of the landfill. The environmental monitoring network to be included in the revised PCMMP will consist of the following monitoring locations:

- Fourteen (14) groundwater monitoring well locations with a total of twenty six (26) discrete wells;
- Four piezometer locations;
- Ten surface water sampling locations, including raw water influent from the Andover; Water Treatment Plant;
- Five surface water gauging locations; and
- Twenty two (22) permanent landfill gas monitoring wells.

The draft PCMMP states a wetlands soil monitoring program will be submitted to MassDEP following completion of the project to monitor the average arsenic concentration in wetland soils and sediment.

The proposed DPW yard for material storage will cover approximately six acres of capped area and will include a paved access road, and a materials laydown area. The design also includes 13 concrete storage bays with asphalt pavement surrounding the storage bunkers. To facilitate material handling and for the control of vehicle traffic, retaining walls will be constructed around and within portions of the DPW yard area. As proposed, the Application seeks approval of two potential construction designs for the surface of the materials laydown area:

1) Primary Design: A 3.5-inch thick asphalt pavement surface that overlays a layer of crushed stone and gravel base (as shown on Sheets D-2 and C-18); and
2) Alternate Design (as revised): A crushed stone finished surface, with a gravel infiltration trench adjacent to the perimeter access road for storm water management (as shown on Sheets D-1 and C-A). This design eliminates certain catch basins and storm water piping located within the crushed stone area.

The storm water management design includes two storm water basins (north and south) and a replicated wet meadow on the eastern edge of the landfill cap. The wet meadow outlet discharges to the south storm water basin via a swale. Storm water from vegetated cap areas will be directed to storm water ponds via berms and let-down channels. Some storm water will sheet flow to land adjacent to the cap. Storm water from the DPW yard will primarily be managed via storm water catch basins and inline separators that discharge to the storm water basins. On May 15, 2018, MassDEP (Bureau of Water Resources) issued approval of the Water Quality Certification for the project.

A settlement analysis of soil stockpile loading effects on the LLDPE FML cap below the proposed DPW yard at two locations (a retaining wall and the material stockpile area) was submitted as part of the NOTD Response. The analysis estimated the vertical settlement at the two DPW locations as

a result of material stockpiling in the DPW yard after construction, where the pre-loading effects (resulting vertical settlement) of adding soils for grading, both below and above the cap, were not previously taken into account. For the retaining wall, maximum primary settlement was under the wall and estimated at 2.9 feet. For the material stockpile area, maximum primary settlement was in the center of the stockpile and estimated at 4.6 feet; settlement at the material stockpile edge was estimated at 2.0 feet. The analysis found the maximum estimated FML strain resulting from settlement was 3.66 percent and located near the concrete bay retaining wall and less than the LLDPE yield strain of 13 percent. The analysis did not evaluate the effect of settlement on storm water management as related to changes in DPW yard grades and storm water management structures, or stability of the DPW yard retaining walls. To minimize post-construction settlement in the DPW yard, a detailed Pre-loading Plan will be required prior to construction to maximize pre-construction settlement in the DPW yard area (refer to Condition 5.c of the decision).

The Town also proposes to complete storm water management improvements along Greenwood Road as part of the landfill closure project. A portion of the proposed Greenwood Road work (inline separator and sections of storm water piping) will occur off cap and on the Landfill property.

Provisional Decision

On April 30, 2018, a Provisional Decision on the Application was issued for public comment. The Public Comment Period on the Provisional Decision closed on May 30, 2018. MassDEP received written comments from the Town and five Town residents (collectively, the Public Comments). MassDEP also received a letter dated November 15, 2018 prepared by CDM on behalf of the Town providing responses to topics raised in the Public Comments. Copies of the Public Comments received by MassDEP and a copy of the November 15, 2018 letter from CDM are attached to the Final Decision as Attachment 2.

After review of all comments received, MassDEP has made the following change to the Provisional Decision:

- Condition 5.g.v of the decision requires submittal of a maintenance plan for the DPW yard area. The condition was revised to also require a Storm Water Pollution Prevention Plan (SWPPP) for the site that includes, without limitation, procedures for the control and prevention of spills at the DPW yard area.

ATTACHMENT 2

Public Comments
Transmittal Number: X275420

Spieler, Richard (DEP)

From: Fairbrother, Mark (DEP)
Sent: Wednesday, May 23, 2018 10:14 PM
To: Moeller, Roger (DEP)
Cc: Spieler, Richard (DEP)
Subject: Fwd: Andover residence want town meeting on Ledge Road landfill

-------- Original message --------
From: Betsy S <bes922@yahoo.com>
Date: 5/23/18 9:20 PM (GMT-05:00)
To: "Fairbrother, Mark (DEP)" <Mark.Fairbrother@MassMail.State.MA.US>
Subject: Andover residence want town meeting on Ledge Road landfill

Dear Mr. Fairbrother:

I would like to voice my disapproval that residents have not yet been allowed a voice in the planned post closure use and funding associated for the Ledge Road landfill.

Reference: Application Transmittal Number: X275420 and FMF Number: 269388

The building of a DPW materials handling area in our watershed at Ledge Road Landfill should be first approved by Town Meeting, but our Manager seems to have been ignoring that requirement. TM has not yet had a chance to discuss, vote on, or approve post-closure use of the site.

Thank you for your attention to this matter.

Sincerely,
Richard and Betsy Streeter
36 William Street
Andover

Spieler, Richard (DEP)

From: Fairbrother, Mark (DEP)
Sent: Thursday, May 24, 2018 3:59 PM
To: Moeller, Roger (DEP)
Cc: Spieler, Richard (DEP)
Subject: FW: Ledge Road Landfill, Andover

From: Alice Jaffe [mailto:armbears@hotmail.com]
Sent: Thursday, May 24, 2018 3:49 PM
To: Fairbrother, Mark (DEP)
Subject: Ledge Road Landfill, Andover

Dear Mr. Fairbrother,

I am concerned about having a DPW materials handling area in our watershed at Ledge Road Landfill. I was under the impression that one of the conditions of granting a permit to the Town is for a Town Meeting vote to occur on post closure use and funding and am interested in your thoughts.

Application Transmittal Number: X275420
FMF Number: 269388

Best,
Alice Jaffe
Andover, MA

Andrew P. Flanagan
Town Manager

TOWN OF ANDOVER

Town Manager's Office
36 Bartlet Street
Andover, MA 01810
(978) 623-8215
www.andoverma.gov

May 29, 2018

Mass Department of Environmental Protection
Northeast Regional Office
Solid Waste Management
Attention: Mark G. Fairbrother, Section Chief
205 Lowell St.
Wilmington, MA 01887

Re: Comments on the Provisional Decision
Application Transmittal Number X275420, FMF Number 269388
Andover Ledge Road Landfill
Corrective Action Design (CAD) & Post-Closure Use (Major Category) Permit Application

Dear Mr. Fairbrother,

We are writing to you to urge you to approve the Town of Andover (the Town) Corrective Action Design (CAD) along with the accompanying plans and Post-Closure Use (Major Category) Permit Application to enable the Town of Andover to continue to move forward on our landfill cap and closure project. Capping and closure of the landfill is a project that the Town has actively pursued for nearly 20 years. When complete, the project will provide significant environmental benefits to the community and surrounding environs, as well as provide protection of area wetlands and the downgradient Fish Brook water supply.

The Andover Ledge Road Landfill was operated from the end of World War II through 1972. Since that time, portions of the landfill have been used as a DPW Materials Handling Area and recreational athletic fields. As presented in the Post-Closure Use Application, the Town intends to reconstruct and continue to operate the existing 6-acre DPW Materials Handling Area atop the landfill, with planned improvements to reduce the impact of the existing facility on the surrounding community. Landfill closure is to proceed per the requirements of the Massachusetts Department of Environmental Protection (MassDEP) Solid Waste Management Regulations (310 CMR 19.000). In addition, removal of arsenic impacted wetland soils downgradient of the landfill will be conducted to satisfy the Massachusetts Contingency Plan (MCP).

In 2005, the Town received a petition from Andover residents requesting that the Ledge Road Landfill be designated as a Public Involvement Plan (PIP) site, in accordance with MGL c21E 14(a). Accordingly, the landfill was designated as a PIP site on September 27, 2005. Over the years, the PIP process has offered residents the opportunity for substantial public input on the landfill closure project.

In 2015, several public meetings were held with the Andover Board of Selectmen to review and discuss post-closure use options for the site. As a result of these meetings, the Andover Board of Selectmen voted in October 2015 to approve continuation of a DPW Materials Handling Area atop the landfill and to reserve 5.5 acres for a possible future solar array. In accordance with this directive, the Town has since worked to design a state of the art DPW Materials Handling Area atop the landfill cap which will facilitate improved operations, site access, stormwater controls, and aesthetics.

The DPW Materials Handling Area is a critical piece of infrastructure needed by the Town to properly manage inert materials from DPW, Plant & Facilities, and Andover School operations and projects. It will enable the DPW to be more

efficient, keep costs down, and provide high levels of service to residents. Without it, costs will rise and service levels will decline.

Design of the DPW Materials Handling Area has taken into consideration resident concerns. Input from the numerous public meetings have been instrumental in guiding the Town in its design decisions. For example, the materials handling area has been relocated and reconfigured to be further away from residences. At the request of local residents, access will be relocated from the existing entrance off Greenwood Road to a new entrance off Chandler Road, with improved line-of-sight for drivers. The facility will include formal bins for materials storage as well as maneuvering and loading areas to generally improve and organize operations. Landscaping and berms have been incorporated into the design to provide screening from nearby streets and homes as well as to reduce potential noise impacts.

The landfill capping and closure project, inclusive of the post-closure use DPW Materials Handling Area, has been subject to numerous environmental and wetland reviews. To date, the project has received:

- A determination under the Massachusetts Environmental Policy Act (MEPA) that no Environmental Impact Report (EIR) is required
- Conservation Commission approval relative to the Town Wetlands Bylaw
- Superseding Order of Conditions (SOC) issued by MassDEP following an Appeal relative to the Massachusetts Wetlands Protection Act
- MassDEP 401 Water Quality Certification, and
- General agreement with the US. Army Corps of Engineers regarding a Programmatic Permit which we understand is to be issued imminently.

The Town has conducted these processes recognizing that protection of Fish Brook, associated wetlands, and our downgradient water supply are of paramount concern. Capping of the landfill will stop the migration of landfill leachate to groundwater, which is currently impacting the downgradient wetlands that are tributary to Fish Brook. Removal of the arsenic impacted sediments will improve the wetland health, reduce human health risks, and contribute to the protection of water quality. The DPW Materials Handling Area has been designed with comprehensive stormwater controls that meet regulatory guidance to ensure capture of any surface water runoff during future operations. And finally, the Town has committed to both a Conservation Easement and Land Preservation Easement in the downgradient wetland areas, which will provide permanent protection from any potential future development.

These efforts undertaken by the Town will help ensure environmental and water supply protections well into the future. We appreciate the technical reviews and input offered by MassDEP and look forward to your approval of the Corrective Action Design and accompanying Post-Closure Use Permit Application.

Sincerely,

Andrew P. Flanagan
Town Manager

May 30, 2018

Mr. Mark G. Fairbrother, Section Chief
Solid Waste Management
Northeast Regional Office
Massachusetts Department of Environmental Protection
205B Lowell Street
Wilmington, MA 01887

COMMENTS – Provisional Decision – CAD/PCU Ledge Rd Landfill in Andover
Application Transmittal # X275240
FMF # 269388

Dear Mr. Fairbrother,

I appreciate the opportunity to comment on these important approvals. While the proposed Corrective Action Design has improved quite measurably over the last several years, I still have some concerns over certain aspects & its implementation; although look forward to the landfill finally being capped as it has been far too long in coming.

Most importantly, though, I am quite concerned about the proposed Post Closure Use – DPW Materials Handling Facility being located at this site as it lies within the Zone A of our Drinking Water Supply. Furthermore I cannot see how this facility as designed and proposed, especially with such intentionally vague details on its operating parameters, can comply with the EPA and DEP regulations regarding Stormwater Management & Source Protection of Drinking Water Supplies, and including 310 CMR 19 Solid Waste Regulations. The proposed use certainly does not appear to be allowed under our local zoning and Watershed Protection bylaws, although I realize that is outside DEPs scope for this application. These serious concerns are exacerbated even more, however, by the proposed Sheet C-A Crushed Stone alternative material laydown area without catch basins and full collection & subsequent treatment of impacted stormwater.

One question though that I would like you or anyone at DEP/EOEEA to answer is: *How could DEP/EOEEA post on its website to protect drinking water that "materials stored by DPWs" should not be located within a watershed as the best practice and then turn around and approve this new uncovered not only DPW materials storage but also processing & handling PCU in a location within our watershed?* It is going backwards, not protective of the environment or drinking water, and as you know there was no "legal" or DEP approved pre-existing operation on the landfill site.

I will try to lay out the specific concerns regarding the CAD/PCU below:

CAD

Odors/Dusts from Wetland Hot Spot Soils

Given that there are downwind residential properties it is critical that steps are outlined to address the odors and prevent any windblown dusts from impacting these residents. These are wetland sediments, when was the last time you disturbed swampy soils and didn't get strong odor? Also there is already a windblown dust problem to abutter from soil stockpiles in the area. Given that these soils are contaminated with >900 mg/kg of Arsenic it is critical they are controlled. It is not credible or comforting to neighbors that CDM does not anticipate any issues. This seems a very likely anticipated nuisance & public health issue that needs to be controlled. 310 CMR 19.115(1), 310 CMR 19.130(16)(a), and 310 CMR 19.140(5)(b)&(d).

Southern Gas Vents/Trench Very Close to New Neighboring Residential Homes

The Southern Gas Vent/Trench will be within ~100+ feet of four new single family homes (last one still to be built at 166/168/170/172 Greenwood). There is nothing in the CAD that describes what will be done to address nuisance odors affecting these homes from vent/trench exhaust? Seems like this will likely be a nuisance and possibly public health issue. 310 CMR 19.115(1) , 310 CMR 19.130(16)(a), and 310 CMR 19.140(5)(b)&(d).

Financial Assurance Mechanism

There is nothing provided in the CAD that describes the Financial Assurance Mechanism to be used per 310 CMR 19.051(12) that ensures the post closure monitoring & maintenance will be adequately funded. Given the Town's known financial issues and looming operating deficits, this is something that should be required to be specifically bonded & approved for with a specific minimum estimated amount set aside.

Pre-Loading

While I understand that a pre-loading plan still needs to be submitted to DEP and approved, there has been no discussion of loading from the future heavy processing activities. Large tub grinders (for logs/wood wastes), ABC crushing/grinding equipment, and 100-Ton long haul trailer along with active loading by other heavy equipment would seem to present a significant risk via settling and damage of the liner. These should be evaluated.

PCU

Stormwater Standards

The proposed DPW Yard PCU does not meet the MA DEP Storm Water Policy as required per 310 CMR 19.115(1) and 19.140(5)(d). This noncompliance is made even worse by the crushed stone alternative for the DPW Yard material laydown area where all stormwater is no longer collected (i.e. significant portion will leach directly into the sand drainage layer) without passing through the inline separator pretreatment devices. How could this setup possibly meet the pretreatment requirement prior to infiltration for an ORW? As stated in the SOOC the DPW Yard and Access Road need to meet the

standards for new development. Given the materials stored/processed in the DPW Yard, nevermind the occasional on-site fueling and snow storage, it is critical that stormwater & the discharges to the ORW are adequately protected in general and from these LHUPPL activities. Appendix A contains summaries of the stormwater issues for the DPW yard operation. While the exact operating scenarios, conditions, and planned measure are not known unfortunately for the DPW yard area awaiting submittal of the final PCCMP, the following items should be addressed by the CAD and are not presently:

a) Interim Period Before Closure – What happens to materials stored at landfill now and related operations? How is the environment & drinking water protected?
b) Existing Soil Stockpile Evaluations – What is the standard (levels) and sampling plan to be used to determine if materials are OK to use for shaping & grading? Where will these results be submitted and who will approve? How will public see them?
c) Proposed Storage Bins – Why are there no covers proposed over the storage bins to minimize stormwater contact & associated runoff with the materials?
d) Crushed Stone Laydown Area - Where is the evaluation or documentation that this alternative will not adversely affect the operation of the downstream inline separators? Would seem necessary given increase in percentage of fines to overall sediment loading.

PCMMP Details Lacking

The Operating & Maintenance Details and enforceable conditions of the proposed DPW Yard PCU are critical to be known prior to approving in order to protect the environment & ORW. There is so much ambiguity (on-site fueling, snow storage, O&M, drinking water tank sludges?) that is seemingly impossible to ensure compliance with 310 CMR 19.115 (1) and 19.140(5). Will the PCMMP to be submitted for approval be issued provisionally and made available for Public Comment? It is critical that is required to be. Existing operations (from perpetually unlocked gates resulting in illegal dumping, to dozens of improperly discarded tires sitting vegetated wetlands, to silt laden stormwater pumped directly into downstream wetlands without any filtration/treatment – all despite dozens of complaints (likely not subsequently submitted to DEP or BOH)) require that the O&M for any PCU be very specific & detailed so that area residents, community, drinking water, are protected.

Other PCUs?

The SOOC discussed public access walking trails around the landfill site. Further Solar Fields were in consideration for other areas of the landfill. These are not mentioned at all in the Provisional Approval. The CAD/PCU should be crystal clear on what is an approved post closure use and any other uses that would require further approval from MA DEP. The public access trail does not seem advisable given that Risk Analysis did not contemplate or evaluate perpetual uncontrolled access to the site and sediments/soils containing arsenic <900mg/kg.

GENERAL ADMINISTRATIVE

Provisional Approval for Future Related Approvals

Given the significance of the PMMCP to the O&M of the DPW yard area and impact to the environment & drinking water it is critical that DEP approval be issued Provisionally with a Public Comment periods. I would like to request that future Solid Waste approvals for this site be issued provisionally to allow for a full Public Comment period.

Please contact me at 781-454-5330 or at ksaxon@aol.com if you have any questions or need additional information regarding these comments.

Thank You,

Keith Saxon
Andover Resident (Not Abutter or in neighborhood near landfill)
15 Wethersfield Drive
Andover, MA 01810
781-454-5330 cell
ksaxon@aol.com

APPENDIX A – Summary Stormwater Issues

LUHPPL

Key point is that it is clear to us that the DPW facility is a LUHPPL that requires compliance with Stormwater Standard #5. Common sense dictates this given the materials stored without cover, heavy equipment planned to be used as needed to move around/ process/ and transport these materials in-and-out of the facility, and the obvious anticipated operations on-site without cover. This is why the DEP and EOEEA state that to protect drinking water supplies DPW material yards should not be placed within the watershed. Commonsense notwithstanding, the regulations themselves also make it clear that the DPW facility is a LUHPPL as defined.

1) Both the EOEEA and MA DEP have indicated as much during the MEPA process
    a. 10/11/16 MA DEP Comments – "MassDEP reminds the proponent that the stormwater discharges to an Outstanding Resource Water. Therefore the project must comply with the Critical Area standard, as well as the Land Use of Higher Potential Pollutant Load. Best management practices also are required to have shut-off capabilities to minimize potential for accidental release of contaminants".
    b. 11/4/16 EOEEA Comments – "The Town should demonstrate compliance with Land Use with Higher Potential Pollutant Loads (LUHPPL)"
2) LUHPPL is defined 310 CMR 10.04 and 314 CMR 9.02, which includes the following
    a. Land uses identified in 310 CMR 22.20C(2)(a)-(k)
    b. Land used identified in 310 CMR 22.21(2)(a)(1)-(8) & (b)(1)-(6)
    c. Areas within site subject to NPDES MSGP
3) 310 CMR 22.20C(2) contains the following:
    a. (f) storage or disposal of snow or ice removed from highways and streets that contain deicing chemicals
        i. The proponent in the LTPPP has declared that "there will no storage of" materials such as vehicles, fuel, etc.
        ii. For snow, however, instead of clearly prohibiting it, an alternative statement is made that "the Town does not intend to use the DPW area for routine snow storage".
        iii. This statement indicates the DPW area could be used for non-routine snow storage as well not ruling out the possibility of routine snow storage. The Town treats its paved areas with deicing chemicals.
        iv. Thus by not specifically prohibiting the potential snow storage the DPW Area is LUHPPL by definition.
    b. (h) junk and salvage operations
        i. Scrap metal generated by DPW and Plant & Facility operations is routinely stored for salvage by the DPW in a bin at its existing Town Yard facility.

ii. Waste materials such as asphalt, brick, concrete (ABC), street sweepings, and catch basin cleanings are stored, consolidated, and processed for re-use (aka salvage).
iii. While the Waste Materials are included in the LTPPP table listing, this is not a complete absolute list as it provides only "Examples" of materials and uses the term "; etc." Thus scrap metal certainly is likely particularly once the existing Town Yard with 13+ bins is replaced by the new location with only 4-bins. Further as has been stated by the Proponent and discussed later in the responses there is no detailed Operational Plan for the DPW facility that has been produced.
iv. Thus the DPW Area is a LUHPPL by definition due to its junk & salvage operations.

c. (k) solid waste handling facility as defined by 310 CMR 16
i. Waste Materials such as ABC, street sweepings, and catch basin cleanings are solid wastes specifically defined under 310 CMR 16 & 19 as solid wastes.
ii. The DPW Area is intended to handle these materials by stockpiling & consolidating them for further re-use or disposal.
iii. At the existing DPW area at the landfill, materials have been processed on-site (by size reduction, screening, etc) to facilitate their reuse.
iv. Further as evidenced by aerial imagery of the existing site significant liquid wastes (broadly defined as "solid wastes") presumably from catch basin cleaning (and perhaps even street sweeping) and sludge removal activities by the mini-vactor have been stored and/or disposed of at the existing DPW area.
v. Thus the DPW is a LUHPPL by definition due to its solid waste handling operations.

4) 310 CMR 22.21(2) contains the following:
a. (a)(4) stockpiling and disposal of snow and ice that contains sodium chloride or other chemicals used for snow & ice removal.
i. As indicated earlier for snow, by not specifically prohibiting the potential snow storage the DPW Area is LUHPPL by definition.

b. (b)(1) storage of sludge as defined in 310 CMR 32.05
i. Sludge includes those from water supply & treatment operations.
ii. As document under the MCP Bancroft Water Tank sludge release filing, the DPW has utilized the landfill DPW materials handling area for the storage and/or disposal of water storage tank sludge/residuals. This is further indirectly evidenced by aerial imagery of the site.
iii. Further the bins at the existing Town Yard are used to store sludges/residuals removed from water lines (and perhaps even sanitary sewer lines) as removed by the Town's mini-vactor unit.
iv. Absent any specific prohibition in the LTPPP or a specific defined Operations Plan the potential for water treatment & other sludges to be stored at the DPW area clearly exists.

v. Thus the DPW Area is a LUHPPL by definition.

5) NPDES MSGP
   a. The NPDES MSGP is for facilities associated with industrial activity as defined by 40 CFR 122.26 (b)(14)
   b. This definition specifically includes facilities that are owned or operated by federal, state, or municipal governments. The key is the MSGP & standards are applicable to a listed industrial "activity" even if only a portion of the site.
   c. Specific Industrial Activities covered under the MSGP include:
      i. Sector N – Scrap Recycling & Waste
         1. As previously established Recycling and Solid Waste Handling activities are associated with materials handled & processed at the DPW area.
      ii. Sector D – Asphalt Paving
         1. The uncovered storage of aggregate, cold patch asphalt, recovered asphalt product, and ABC asphalt for reprocessing/reuse are prior uses at the Town Yard / Landfill and reasonably anticipated at the DPW area.
   d. The NPDES MS4 permit under Section 2.3.7(b) further states that "public works yards and other waste handling facilities where pollutants are exposed to stormwater" require a SWPPP unless "the facility has developed a SWPPP or received a no-exposure certification" under the MSGP. This paragraph clearly indicates that either standard may be applicable to such facilities. In fact in discussions with EPA, they explained that this section was specifically added to address the confusion between facility type (industrial or municipal) designation versus the classification of specific activity (i.e. industrial type) requiring a SWPPP to control & prevent stormwater pollution.
   e. Thus the DPW Area is a LUHPPL by definition.
6) Massachusetts Stormwater Handbook provides guidance on the applicability of Standard 5 and LUHPPLs. In particular Volume 1 Chapter 1 under Standard 5 contains explanatory language consistent with the explanations provided above. Further Table LUHPPL in this section describes LUHPPLs that have the potential to generate higher potential pollutant loads of oil and grease which include:
   a. "Log Storage Yards"
      i. The DPW Area at the landfill has historically been used for log storage from tree department operations particularly following major storms including subsequent chipping & operations. It is reasonably anticipated that will occur given the large laydown area provided and transfer of this operation to the Bald Hill facility is not an approved use under Article 97 at that site.
   b. "Fueling Stations"
      i. The Proponent indicated on 2/22/17 that "occasional on-site fueling" will occur at the DPW area.
   c. "Construction Businesses"
      i. The materials stored in the storage bins, the storage bin layout, and staging project laydown area in the DPW area are nearly (if not entirely) identical to a construction business (aka as a contractor yard).

d. "Paving"
    i. As established previously the aggregate, cold patch, RAP, and ABC asphalt reclaim reasonably anticipated to be stored in the DPW area are consistent with Paving operations. Not surprising given the significant annual road paving effort by DPW and hired contractors that use the existing DPW materials handling area.
e. Thus by detailed description in the Stormwater Handbook defining the Stormwater Standards the activities and materials DPW Area is a LUHPPL.

7) Oil & Grit Separators
    a. As indicated above in item #6 the DPW facility also requires oil & grit control per the items.
    b. Further as was originally stated in the last several years there have been at least 3 (& perhaps more) MCP reportable releases of oil from the DPW heavy equipment. This is not surprising given the large quantities of diesel fuel and hydraulic fluid present on this type of equipment which will be in regular operation at the DPW facility.

RESPONSES TO 8/1/17 CDM COMMENTS ON RSOOC

STORMWATER

1) *General*.
    a. *This Crushed Stone Laydown Area was not evaluated or detailed in the Stormwater Report submitted with the NOI*.
        i. Point remains the same. While there was a brief discussion in the NOI text for an all gravel vs paved alternate for the DPW area, the Stormwater Report describes SMS treatment train including catch basin and closed drainage systems for entirely paved areas. This matters as follows:
            1. The now gravel sections previously included closed catch basins which collect all liquids (oils & other liquid contaminants) and convey them through the CDS units. The proposed gravel infiltration trenches don't do this. The trenches have a single perforated pipe in the center and are surrounded by filter fabric. A significant portion of any oils reaching the trenches will not enter pipe and will be infiltrated.
            2. The runoff coefficient is different for gravel than pavement, as confirmed by the proponent's statement "*more conservative alternate (i.e. paved)*" and the fact that 18" underdrains have been included in the areas under the gravel. Thus less stormwater will enter the SMS treatment train and be adequately treated. Nevermind the increased potential for oils and other liquid contaminants to not be contained and simply leach below the "packed gravel layer".
    b. *It does not meet the 44% ORW pretreatment requirement for critical areas*

i. There still is no 44% pretreatment provided before the infiltration BMPs as required for ORWs which in this alternative case are now the gravel **infiltration** trenches and/or 18" underdrains that have no pretreatment.

ii. The Stormwater Peer Reviewer was clear on the need for 44% pretreatment prior to infiltration BMPs even for those over liners in contrast to CDMs alternative assertions. This is one of the key reasons why a CDS unit was added prior to the Southern Basin.

c. *It does not meet the 80% removal requirement for the infiltration basins*

i. There is no documentation in the Stormwater Report on the treatment efficiency of the Gravel Infiltration Trenches.

ii. More importantly there is no information provided on the quantity of any drainage that will actually enter CDS units through the trenches. By design it is obviously not all.

d. *There are no suitable source control and/or pollution prevention measures to contain any spills during normal operations from DPW equipment.*

i. Planned operations have not been fully described so how can any adequacy be determined. An Operations Plan was first stated to have been included in the CAD submittal. Now it is stated this plan is to be included with the Closure Certification not planned to be submitted until 2020 at the earliest. Given the thousands of pages of documents submitted just in the last few years alone, it is truly puzzling why such a Plan can't be prepared. Further if the planned operations are not known then how could a WPA approval be issued that would be adequate to address Stormwater pollutants when all the operations, activities, and materials exposed to precipitation are not known?

ii. The SWPPP has not been prepared or provided. So again how can adequacy be determined?

iii. Obviously oils and other liquid materials (such as the residuals from catch basin cleanings and street sweepings) will not be completely contained with a gravel surface with 18" underdrains or gravel infiltration trenches.

iv. Proponent has indicated that "occasional on-site fueling will occur". Fuel spills will not be contained on gravel with 18" underdrains or through gravel infiltration trenches.

v. Proponent has indicated that "routine snow storage is not intended". Thus it is not precluded like the other materials listed on the LTPPP and clearly implies that it may happen on a routine basis and certainly on a non-routine basis. The gravel with 18" underdrains and gravel infiltration trenches do not provide the oil/grit control as prescribed for this LUHPPL use with ORW discharge.

e. *This Bid Alternate was not evaluated or detailed in the Stormwater Operation & Maintenance Plan or Long Term Pollution Prevention Plan.*

i. Proponent acknowledges that it is not detailed in the Stormwater O&M Plan. How then will the Gravel Infiltration Trenches be maintained?

ii. Proponent acknowledges that it is not detailed in the LTPPP. How then will oil and other liquid contaminant spills be contained & cleaned up?

f. *It should be made clear that Sheet C-A is not approved by this OOC.*

i. Proponent states that Sheet C-A was included with the original NOI submission. This is false as Sheet G-1 "Sheet Index" clearly indicates that Sheet C-A was NOT included with the NOI as it does not contain an "*" after its title which per the sheet are "Plans included with the NOI".

ii. It is clear that the Sheet C-A was not included with the plans provided for the initial Stormwater Peer Review as it refers to the Plan Set as having 26-pages. Per Sheet G-1 there were 26-sheets submitted with the NOI while 50-sheet titles are listed on the index.

iii. Further as has been established the alternative stormwater management system was not specifically evaluated in Stormwater Management Report.

2) *There are two primary Stormwater Management Systems ..... that either have a direct or overflow discharge into or immediately adjacent to resource areas (LUW/BVW) and/or are within the Buffer Zone per 310 CMR 10.05 (k). It is important to note that such discharges are to Outstanding Resource Water – Public Water Supply.*

i. Proponent acknowledges location within buffer zone and/or resource area.

ii. As stated elsewhere we strongly disagree with the Proponent's statement that the SMSs as proposed comply with the Stormwater Management Standards and Article XIV of the Town's Bylaws.

3) *There are thirteen Open Material Storage Bins, i.e. uncovered and exposed to precipitation, provided in the Material Handling Facility. Information in the NOI and Stormwater Report indicate that they will be used to store a variety of waste materials for reprocessing for recycling/reuse or off-site disposal, including catch basin cleanings, street sweepings, asphalt & concrete debris, and excavate. Construction materials are also indicated as being stored which may include sand, soil, or cold-patch asphalt are stored in such bins. A laydown area for logs/trees during storm removal is also provided. Use of the DPW Material Handling Facility for Snow Storage is NOT specifically excluded, just simply a statement that it "is not the intent" to use the facility for snow for "routine" snow storage. Further information provided by the applicant indicates that there may be the "occasional need for on-site fueling". Lastly, a detailed operation plan for the area has not been included with the NOI, which is important, as it would reasonably be anticipated that size-reduction processing activities would occur on-site using mobile heavy equipment (wood grinding/chipping, asphalt & concrete size reduction, soils processing/screening).*

i. Proponent states that the materials stored in the bins will be covered as required by the regulations. This is an empty statement as the regulation(s) they refer to are not cited, so to which do they refer?

ii. Most importantly the 100% Design Plans do not include covers for any of the bins on any of the design sheets or details.

iii. Proponent states that an Operations O&M plan will be included with the Closure Certification due to be submitted in 2020. How can the Stormwater

Standards be met if it unknown what uses, equipment, & materials will be exposed to precipitation?

4) *The Stormwater Report indicates that the DPW Material Handling Facility is not a LUHPPL. This not accurate as solid waste material storage & handling occurs (MGSP Sector N), occasional fueling, non-routine snow storage, and routine use & presence of heavy construction equipment (DPW trucks, dump/haul trucks, loaders, tub grinders/processing equipment. Both DEP and EOEEA indicated as such in their MEPA Documents. Further operations included in the Stormwater Standard LHUPPL table are present such as log storage (storm laydown & processing), construction (materials storage), paving (recycled aggregate product & cold patch asphalt storage), heavy equipment (routine use & overnight storage during processing runs), fueling (occasional need for mobile fueling of equipment). The new MS4 permit also makes clear in Section 2.3.7 that such operations can be permitted & provided with a SWPPP under either program, the point being that just because it is doesn't have a MSGP permit doesn't mean it is not a LHUPPL use, in fact it is because it is that type of facility & use that it is required to have a SWPPP under the MS4. The Stormwater Report should be corrected to indicate LUHPPL use at the DPW Materials Handling Facility.*

   i. Proponent again incorrectly states that the DPW post-closure use is not a LHUPPL per state regulations and then provides citations.
   ii. Please refer to the additional information section under LUHPPL.

5) *As a LUHPPL, with uses with higher potential for oil & grease (occasional fueling, routine heavy truck/equipment usage, construction, paving, etc) the Stormwater Standards require an oil grit separator or equivalent. The proprietary separators may be equivalent, however, the Peer Reviewer or ACC did not make such determination given the incorrect statement on LHUPPL.*

   i. Please refer to LUHPPL under additional information section.
   ii. Acknowledge the CDS units contain oil baffle components per Design Drawings.
   iii. The question remains however whether these baffles are sufficient to meet oil/grit removal standards.

6) *No plan is provide for where the snow will be plowed or disposed from the paved areas of the DPW Material Storage Area. Given the ultimate discharge to ORW this is important to provide.*

   i. Why do we need to wait until 2020 to find out where the snow will be plowed to? This is a pretty basic question and request.
   ii. Why can't the proponent state or commit to not plowing the snow towards the West facing slope into the Zone A / Buffer Zone and instead towards the East side of the DPW area?
   iii. DEP has consistently stated that pollution prevention and source control measures are especially important to protect public drinking water supply.

Spieler, Richard (DEP)

From: Fairbrother, Mark (DEP)
Sent: Wednesday, May 30, 2018 5:02 PM
To: Moeller, Roger (DEP)
Cc: Spieler, Richard (DEP)
Subject: FW: Public Comments: Ledge Road Landfill (Application Transmittal Number: X275420 AND FMF Number 269388)
Attachments: TruckHourRestrictions.pdf; SP10-04earthmovementWeepingWillow.pdf; DPW Emails on Security and Illegal Dumping.pdf; Andover Bike Routes.pdf; Additional Emails from May 2017 to May 2018 on Security and Illegal Dumping.pdf; Reported Incident History at Ledge Road Landfill since 1992.pdf; Comparison and Campanelli.pdf

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From: Albuquerque, Jose [mailto:jalbuquerque@bwh.harvard.edu]
Sent: Wednesday, May 30, 2018 4:58 PM
To: Fairbrother, Mark (DEP)
Cc: Stacey&Joe
Subject: Public Comments: Ledge Road Landfill (Application Transmittal Number: X275420 AND FMF Number 269388)

Dear Mr. Fairbrother,

Please find public comments and concerns regarding to the Ledge Road Landfill Closure Project in Andover (Application Transmittal Number: X275420 AND FMF Number 269388), due on or before 05/30/18. My wife and I feel it is very important that this landfill closure project and any post-closure use recommendations are done right from design to construction. The following information, links and video clips include, but is not limited to comments regarding to post closure use recommendations, environmental and public health impacts, public safety concerns, and Town Meeting vote.

First, we hope that your office reconsiders its decision in recent approval of Corrective Action Design and authorization to construct decision letter dated 04/30/18 related to the construction design for the surface of the DPW materials area by requiring the Town to construct the primary design detailed on page 4 of 15 as it is a superior option for protection for materials proposed to be stored and storage of equipment and supplies than the revised Alternate Design.

We would like to provide you, respectfully, for your review potential short-term and long-term environmental impacts related to the proposed and permanent Department of Public Works (DPW) materials handling area. This proposed area will include storage, management, and disposal of solid waste materials such as asphalt millings, street sweepings and catch basin cleanings, along with potential snow dumping, which all are not permitted in the Town's Watershed Protection Overlay District (WPOD) as stated in Andover's Zoning By-Laws in Section 8.1.16 under Prohibited Uses. This DPW area will expand to include, as previously mentioned, storage of seasonal equipment and supplies as well as staging area for Town projects. Please note that the closure project at Ledge Road Landfill is located within the WPOD.

This overlay district, defined in Section 8.1 of Andover's Zoning By-Law, was instituted "to preserve and protect surface and ground water resources in the Fish Brook/Haggetts Pond Watershed Protection Overlay District (WPOD) for the health, safety and welfare of its people", and "to protect the community from detrimental use and development of land and waters within the WPOD". The WPOD includes all the lands which create the catchment or drainage areas of Fish Brook or Haggetts Pond as part of their natural or man-made drainage system. The existing landfill is a large plateau extending north to south from Ledge Road to a wetland floodplain connected to Fish Brook. Fish Brook is a tributary to Haggetts Pond, the primary source of drinking water for Andover. Both water bodies are "Class A" drinking water sources. Andover also provides drinking water to our neighbor community of North Reading and serves a population of approximately 48,000 persons." Furthermore, I would like to point out environmental stewardship tips for drinking

water on MassDEP's Energy and Environmental Affairs (EEA) website, where it states to prohibit the storage of materials used or collected by the DPW near drinking water supplies.

In fact, last summer (2017), Conservation Commission conducted an open survey where residents wanted better protection for open space and even more protection for our drinking water plus the watershed protection overlay district (WPOD), when it came to our natural resources according to Andover Townsman article.

As healthcare professionals, my wife and I are concerned about the impacts of air quality, gas emissions, water pollution, and excessive noise that will occur with such a commercial like enterprise in a residential neighborhood that has many families with young children (one diagnosed with asthma) and along with retired citizens. The following are studies and findings that show the negative impacts and results of such activity:

- Ambient air pollution is a health hazard to children

  Outdoor air pollution is now recognized as an important problem, both nationally and worldwide. Children and infants are among the most susceptible to many of the air pollutants. Recent studies have found links between air pollution and respiratory symptoms, asthma exacerbations/hospitalizations, preterm births, infant mortality, deficits of lung growth, and possibly, development of asthma. This policy statement from American Academy of Pediatrics concludes with recommendations to the government on promotion of effective air pollution policies to ensure protection of children's health.
  Committee on Environmental Health, et al. (December 2004). Ambient Air Pollution: Health Hazards to Children. PEDIATRICS, Volume 114, No. 6: 1699-1707.

- The American Academy of Pediatrics' Summary of Findings
  - Air Pollution and Human Health: Scientific experts now believe the nation faces an epidemic of illnesses that are exacerbated by air pollution. These illnesses include cardiovascular disease, asthma and lung cancer.
  - Children at Special Risk: They have concluded that levels of ozone and particulate matter are high enough in many parts of the US to threaten children's health.
  - Elderly at Special Risk: Cardiovascular disease, hypertension, diabetes and cancer are all illnesses disproportionately borne by the elderly.
  - Diesel Exhaust: Diesel exhaust is especially dangerous, containing nearly 40 hazardous pollutants. These fine particles may be deeply inhaled into the lung and carry with them a collection of attached hazardous compounds. Diesel emissions increase the severity and duration of asthma attacks.
  - Diesel Emissions: It recommends that children's exposure to diesel exhaust particles should be decreased and that idling of diesel vehicles in place where children live and congregate should be minimized to protect their health.

- Asthma symptoms caused by truck exhaust

  A study was conducted in Munster, Germany to determine the relationship between truck traffic and asthma symptoms. In total, 3,703 German students, between the ages of 12-15 years, completed a written and video questionnaire in 1994-1995. Positive associations between both wheezing and allergic rhinitis and truck traffic were found during a 12 month period. Potentially confounding variables, including indicators of socio-economic status, smoking, etc., did not alter the associations substantially.
  Duhme, H., S. K. Weiland, et al. (1996). The association between self-reported symptoms of asthma and allergic rhinitis and self-reported traffic density on street of residence in adolescents. Epidemiology 7(6): 578-82.

- Truck traffic linked to childhood asthma hospitalizations

  A study in Erie County, New York (excluding the city of Buffalo) found that children living in neighborhoods with heavy truck traffic within 200 meters of their homes had increased risks of asthma hospitalization. The study

examined hospital admission for asthma amongst children ages 0-14, and residential proximity to roads with heavy traffic.
Lin, Munsie, Hwang, Fitzgerald, and Cayo. (2002). Childhood Asthma Hospitalization and Residential Exposure to State Route Traffic. Environmental Research, Section A, Vol. 88, pp. 73-81.

- Evidence shows respiratory effects of diesel traffic exposure in asthma

  Air pollution from road traffic is a serious health hazard and particulates from diesel exhaust have become cause for increasing concern. Study investigated the effects of short-term exposure to diesel traffic in people with asthma in an English urban, roadside environment. Conclusions served as a demonstration and explanation of the epidemiologic evidence that associates the degree of traffic exposure with lung function in asthma.
  Cullinan, M.D., Paul, et al. (2007). Respiratory Effects of Exposure to Diesel Traffic in Persons with Asthma. New England Journal of Medicine, Vol. 357, pp. 2348-58.

- Exposure relationship between road traffic noise and coronary heart diseases

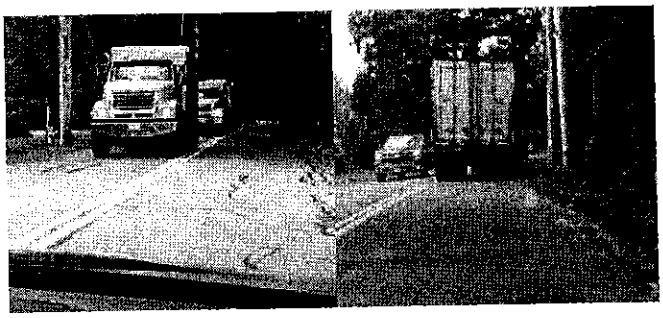
  A meta-analysis of 14 studies on the association between road traffic noise and coronary heart diseases was carried out. The result of the meta-analysis complies quantitatively with the result of a recent meta-analysis on the association between road traffic noise and hypertension. Road traffic noise is a significant risk factor for cardiovascular diseases.
  Babisch, Wolfgang. (January-February 2014). Lin, Munsie, Hwang, Fitzgerald, and Cayo. (2002). Updated exposure-response relationship between road traffic noise and coronary heart diseases: A meta-analysis. Noise and Health.

As you already know, all of the trees and woods at the landfill site and downstream, where the arsenic is located, will permanently removed and never replaced. Thus, eliminating a natural buffer zone, which helps to reduce air and noise pollution. Even though there will be potential short-term impacts that may occur during construction to close and cap the landfill, including traffic, noise, air quality, and water quality inclusive of wetlands, these are temporary and will cease once construction has been completed. Unfortunately, the DPW component of post-closure use will be permanent and have long-term impacts that will be irreversible to both the environment and public safety.

In CDM submittals to agencies such as MEPA, it was pointed out in said report that the hours to be 7 AM to 4 PM for this DPW materials and storage area. As an impacted abutter, Town trucks and vehicles use the current temporary landfill area Monday through Saturday, or six days a week. Major question here is why would this facility when fully operational not be restricted similar to other materials handling and construction projects that may exist within residential neighborhoods in Andover? The Town does not permit use of these sites to conduct activities until after last school bus pickup and first drop off during school season. See attached permit approvals for Trinity Court (Item 17 & 21), which was built within past five years across from former Ledge Road off Greenwood Road and the potential Weeping Willow project (see page 91 paragraph 2 and page 94, item 20), a residential development, across the former Deyermond Fields and parking lot area off Chandler Road, that contains such language as both Greenwood and Chandler roads are active school bus routes and have no sidewalks. Please consider including such language with regards to time of day restrictions for DPW activites when school is in session to final post closure permit if your office does not change or reconsiders its provisional decision issued on 04/30/18 to approve DPW materials area.

Additionally, CDM traffic engineer stated in the MEPA report that both Greenwood and Chandler roads are narrow and windy at certain sections that would need to encroach into other lanes. We realize that this may need to be tolerated during construction related to capping and closing the landfill. However, there are serious public safety issues here when introducing larger and oversized trucks constantly navigating these narrow roadways to haul materials and equipment on and off site from the DPW materials area to some other area in or out of Town whether it be for projects or disposal. To make matters worse, we have definitely seen an increase in traffic volume since the introduction of the Waze app, which helps to outsmart traffic and get drivers the best route to work and back every day, making Greenwood a very popular cut through for Interstate Route 93. Please note that the Greenwood/Route 133 intersection

is Level F according to MassDOT. It is worth to note that both Chandler and Greenwood are part of our Town's bike routes. Residents have expressed concerns for years of public and pedestrian safety.



There are very serious concerns pertaining to DPW's ability of being the designated responsible party for this "high impact" controlled site in our watershed next to our drinking water. It is troubling that the Town will also allow private contractors to use this future DPW materials handling area. Moreover, we are alarmed by the continued issues of illegal dumping, suspicious activity, and security gate being left open for various reasons that plague the site now (see attached emails on security and illegal dumping along with reported incident history). As you recall, Andover Fire Department reported an incident to MassDEP back on 08/06/5 when a piece of equipment caught on fire, apparently caused by vandalism, resulting in the release of diesel fuel, hydraulic oil, and motor oil.

In addition, CDM has not performed a full review of project alternatives to include reduce or even eliminate this DPW component. The DPW layout was always required and was included with solar as part of the Board of Selectmen's recommendations on post closure use in October 2015 (see attached Comparison and Campanelli document). This was prior to the Town purchasing land off Campanelli Drive in Andover six months later at 2016 Annual Town Meeting to relocate and consolidate Municipal Services, which includes stage materials bins (see attached Comparison and Campanelli document), in a single central location, which is right off River Road exit on Route 93. We feel that this topic of potentially not needing (or no longer needing) to have a DPW handling area at Ledge Road has not been revisited or re-evaluated to see if outsourcing said material operations would be cost effective similar to Town of Tewksbury and Department of Conservation and Recreation (DCR) and/or storing materials and equipment instead at the new Municipal Services site since purchasing land off Campanelli Drive.

Furthermore, despite repeated assurances that Town Meeting would vote on post closure use recommendations and funding (see below for some examples), the Town continues moving forward towards construction of an unauthorized six acre DPW facility on the landfill. Please note that voters passed private warrant articles at both 2017 & 2018 Annual Town Meetings (TM), respectfully, to prohibit any post closure use (Article 76 as stated in Townsman) and any funding for construction for such post closure use until future TM approvals.

- At 06/11/15 landfill workshop held by the Selectmen, in response to the question on the hierarchy of the Town, Selectman Vispoli responded that this board would make the final decision for Town Yard as well as this (landfill post closure use) and that there will be a Town Meeting vote. Selectman Paul Salafia agreed as stated in the Townsman. Please click here to view video clip.

- At 10/05/15 Selectmen meeting, they recommended DPW materials & solar for landfill post closure use. Selectmen Landry & Kowalski discussed next steps as it would have to go to Town Meeting in May 2016, which never happened, and before June deadline for filing, but that it could be amended if residents preferred athletic fields instead. Unfortunately, this never occurred at 2016 Annual Town Meeting. Please click here for video.

- At 2016 Annual Town Meeting, the Town Moderator clarified during Article 25 discussion that all stabilization funds appropriated or transferred were solely for the purpose of capping and closing the Ledge Road landfill, and not for any post-closure use. Any remaining funds after landfill closure could then be allocated for post-closure use, but only after an affirmative vote at a future Town Meeting. Town Manager confirmed this for the Moderator by stating, "That's right". Please click here to view it.

Again, since the Selectmen made the post closure use recommendations of DPW materials area and solar, there has never been any analysis presented at the Town Meetings on costs to taxpayers for operations and maintenance related to this high impact development at the landfill. The new Municipal Services Town Yard would now be a more suitable location for street sweepings and catch basin material, for example, as oversized trailers from I93 hauling these materials off-site to New Hampshire would be limited to Campanelli, which is located in an industrial zone and directly off the highway.

Moreover, at a recent April 2018 Selectmen meeting, Municipal Services stated that solar, which was to be installed on the other 6 acres is no longer viable option. So shouldn't taxpayers and voters have a say on what should happen with the remaining 6 acres that was allocated for it? For instance, a fields study completed in the summer of 2017 by consultant, Activitas, concluded that the Town was deficient in field space and, moreover, that as programs and user numbers continue to grow the maintenance requirements and need for field space would increase.

Finally, Town Meeting voters, who have never adopted or appropriated funds for these post closure use recommendations made by the Selectmen in 2015 for post closure use, feel that the proposed DPW facility located both in a residential neighborhood and the Watershed Protection Overlay District for our drinking water is environmentally inappropriate and inconsistent with residents' stated values. Residents have voted in favor and approved these warrant articles on each occasion as they want to decide what their tax dollars are spent on and where Town facilities are located.

We respectfully recommend and urge your office to consider having a condition placed on this decision that prior to "authorization to construct", which includes a DPW materials facility, that such and all post closure use recommendations require a Town Meeting vote of approval.

Thank you very much for the opportunity to provide comments.

Regards,
Joe Albuquerque
197 Greenwood Road
Andover, MA 01810

The information in this e-mail is intended only for the person to whom it is addressed. If you believe this e-mail was sent to you in error and the e-mail contains patient information, please contact the Partners Compliance HelpLine at http://www.partners.org/complianceline . If the e-mail was sent to you in error but does not contain patient information, please contact the sender and properly dispose of the e-mail.

provide the Planning Department with a municipal lien certificate indicating that all taxes, assessments and charges have been paid in full as required by MGL, Chapter 60, Section 23;

Prior to Construction

16. Prior to any construction activity of any kind within the subdivision the developer shall submit for review and approval to the Planning Department a proposed construction sequence schedule in a form provided by the Department, said schedule to be used as a guide to activities within the development including construction of roadways, utilities, drainage systems, stabilization, and stockpiling. This schedule once established shall not be deviated from, but may for good and demonstrated reason, be modified by agreement between the developer and the Planning Department;

17. Construction traffic associated with this subdivision shall be regulated by the Inspector of Buildings. Prior to commencing hauling operations, a hauling route shall have been reviewed and approved by the Inspector of Buildings. Any deviation from the approved route and/or scheduling once established shall require proper notification and approval from the Inspector of Buildings. Construction traffic shall be defined as large trucks hauling earth moving equipment, dump trucks, trucks hauling building materials, cement trucks, and contractors' vehicles larger than panel trucks. Hauling of earth materials and heavy equipment is restricted to the time period between the last morning pick-up of school children, and the first afternoon drop off. It shall be the developer's responsibility to inform all contractors, subcontractors, vendors, and workmen of this restriction, which shall be enforced under the provisions of Section V.H. of the Board's Rules and Regulations;

18. Prior to any construction activity of any kind within the subdivision the developer shall submit for review and approval to the Planning Department a detailed schedule of the anticipated earth operations;

19. Prior to introduction of construction equipment onto the site a meeting shall be conducted between the developer, the developer's contractors, and the Planning Department, as well as the Conservation Department, and Department of Public Works for the purpose of reviewing these conditions and the construction sequence schedule;

20. Once paved, the roadway Trinity Court shall be kept clear and passable at all times. No equipment shall be parked in such a manner as to render the roadway impassable, and no refuse containers, trailers, or construction materials of any kind shall be placed or stored upon the street nor within the cul-de-sac island;

Throughout Construction

21. Construction equipment or materials shall not be parked, stored, or placed in any area directly adjacent to or upgradient of any drainage channel or wetland area, nor in the cul-

which a definitive subdivision plan entitled 228 Salem Street would take place.

In consideration of the Special Permit for Earth Movement, the applicant had submitted an earth quantities plan and an erosion and sedimentation control plan for review. In the analysis, as prepared by Andover Consultants there will be approximately 930 cubic yards of material imported to the site. It has been the past practice of the Planning Board to regulate the hours and days of the earth movement activities. In this instance, the Planning Board has determined the scope of the original approval in 2006 has not changed. The special permit issued in 2006 has expired but the subdivision is still valid. The amount of earth movement and controls in place for the conditional approval of the subdivision made the best feasibme use of the exisiting topography. By conditioning the timing of earth movement activities to the time period between the last morning pick-up of school children, and the first afternoon drop off the use will not be unreasonably detrimental to the established for future character of the neighborhood or town and further that there are adequate public roadways and municipal utilities.

In consideration of the abutting residences, the anticipated hauling operations associated with the development, the existing vegetation, and the preservation and protection of significant natural features, the Planning Board has conditioned their approval to help mitigate any adverse effects that may be associated with this development. In the opinion of the Board the issuance of the special permit (with appropriate conditions) will not result in unreasonable detriment to the neighborhood or the Town.

In consideration of all of the foregoing, including the plans, documents, and testimony given during the public hearing, the Planning Board hereby approves and issues a Special Permit for Earth Movement, applicable to the property earlier described, and subject to the following conditions:

Conditions of Approval

General Conditions

1. For purposes of this approval the subdivision shall be defined as all features depicted on the plans described under condition number 2; the developer shall be defined as the applicant, Gerard and Jean D. LaCroix, and its assigns or successors in title to the development, and all contractors and subcontractors under control of or in service to the developer;

2. Except as otherwise provided for in these conditions the construction of the subdivision and all activities associated therewith shall be in conformance and compliance with the information, details, notations, grading and features shown on the following plans and drawings:

    a. Sheet 1 of 2, Definitive Subdivision Plan 228 Salem Street dated April 28, 2006 last revised August 15, 2006, as prepared by Andover Consultants, Inc.

    b. Sheet 2 of 2, Grading & Erosion Control Plan, dated April 28, 2006 last revised August 31, 2006, as prepared by DK Engineering Associates, Inc.

Prior to Construction

13. Prior to any construction activity of any kind within the subdivision the developer shall submit for review and approval to the Planning Department a proposed construction sequence schedule, said schedule is to be used as a guide to activities within the development including construction of roadways, utilities, drainage systems, stabilization, and stockpiling. This schedule once established shall not be deviated from, but may for good and demonstrated reason, be modified by agreement between the developer and the Planning Department;

14. Construction traffic associated with this subdivision shall be regulated by the Inspector of Buildings. Prior to commencing hauling operations, a hauling route shall have been reviewed and approved by the Inspector of Buildings. Any deviation from the approved route and/or scheduling once established shall require proper notification and approval from the Inspector of Buildings. Construction traffic shall be defined as large trucks hauling earth moving equipment, dump trucks, trucks hauling building materials, cement trucks, and contractors' vehicles larger than panel trucks. Hauling of earth materials and heavy equipment on the site is restricted to the time period between the last morning pick-up of school children, and the first afternoon drop off. It shall be the developer's responsibility to inform all contractors, subcontractors, vendors, and workmen of this restriction, which shall be enforced under the provisions of Section V.H. of the Board's Rules and Regulations;

15. Prior to introduction of construction equipment onto the site a meeting shall be conducted between the developer, the developer's contractors, and the Planning Department, as well as the Conservation Department, and Department of Public Works for the purpose of reviewing these conditions and the construction sequence schedule;

16. Prior to any construction activities on the site the Declaration of Common Scheme Restrictions shall be reviewed and approved by Town Counsel. Upon acceptance of said restriction by the Planning Staff, the restrictions shall be recorded at the Essex North Registry of Deeds with proof of recording provided to the Planning Division;

17. Prior to construction, the limit of disturbance shown on sheet 2 of said plan shall have been clearly marked on the ground, and said marking shall consist of siltation fencing, surveyor's flagging, ribboned stakes at appropriate intervals, and/or a combination of such devices as determined suitable by the Planning Division, and following the installation of such markings no earth disturbance or removal of vegetation of any kind shall be permitted within the protected areas. This restriction may not be released and shall survive changes in ownership of any subject lot;

Throughout Construction

18. Construction equipment or materials shall not be parked, stored, or placed in any area directly adjacent to or upgradient of any drainage channel or wetland area, nor in any cul-

Bk 12332 Pg90 #34340
12-15-2010 @ 01:00p

DECISION OF THE ANDOVER PLANNING BOARD
AS A SPECIAL PERMIT GRANTING AUTHORITY

(11)

ON THE APPLICATION OF

Greenwood-Andover Development, LLC

For a Special Permit for Earth Movement under Section 6.3 of the Zoning By-Law.

RECEIVED
TOWN CLERK'S OFFICE
2010 OCT -1 A 10:30
TOWN OF ANDOVER, MASS

Decision: SP10-04

YES (with conditions)

A public meeting of the Planning Board was held on September 28, 2010, in the Third floor conference Room of the Town Office Building. Present and voting in the affirmative on the matter were members Joan Duff, Vincent Chiozzi, Linn Anderson, John McDonnell and Mark Yanowitz.

Pursuant to public notice in the Andover Townsman, a newspaper of general circulation in the Town of Andover, published on July 22, 2010 and July 29, 2010, and notice sent by mail, postage prepaid, to all interested parties pursuant to the provisions of Massachusetts General Laws, Chapter 40A, a public hearing was convened on August 10, 2010 on the application of Greenwood-Andover Development, LLC for a Special Permit for Earth Movement associated with a Definitive Subdivision development of a residential subdivision. The hearing was continued and closed on September 21, 2010, with the aforementioned members of the Board present throughout.

Premises affected is property owned by O. Michael & M. Frances Bellia, Trustees of 212 Greenwood Rd Realty Trust located at intersection of Greenwood and Chandler Road and shown on Assessors Map 129 and Lot 14A & 14B, comprising of 10.4-acres, hereinafter referred to as the "site", on which a definitive subdivision plan entitled Weeping Willow Estates would take place.

In consideration of the Special Permit for Earth Movement, the applicant had submitted an earth quantities plan and an erosion and sedimentation control plan for review. In the analysis, as prepared by DK Engineering Associates the site cut volume is approximately 8,450 cubic yards and the site fill volume is approximately 8,400 cubic yards. It has been the past practice of the Planning Board to regulate the hours and days of the earth movement activities. In this instance, the Planning Board has conditioned their approval by restricting earth movement activities to the time period between the last morning pick-up of school children, and the first afternoon drop off.

In considering a special permit for earth removal and regrading the Planning Board must find that the subdivision plan with which it is associated, as a whole, makes the best feasible use of existing topography. The Board must also find that the proposed use will not be unreasonably detrimental to the established or future character of the neighborhood or the town, and further that there are adequate public roadways and municipal utilities. In considering a special permit the Board can, and will, impose such conditions or safeguards, as it deems reasonably necessary.

In the opinion of the Board, the subdivision plan as a whole, makes the best feasible use of the existing topography; the areas of the building lots themselves; and the roadway profiles which will not involve major cuts or removal of earth materials from the site. Although the development is being constructed in an established neighborhood, any adverse effects to those abutters can be mitigated through the regulation of hours of operation.

In consideration of the abutting residences, the anticipated hauling operations associated with the Weeping Willow Estates development, the existing vegetation, and the preservation and protection of significant natural features, the Planning Bard has conditioned their approval to help mitigate any adverse effects that may be associated with this development. In the opinion of the Board the issuance of the special permit (with appropriate conditions) will not result in unreasonable detriment to the neighborhood or the Town.

In consideration of all of the foregoing, including the plans, documents, and testimony given during the public hearing, the Planning Board hereby approves and issues a Special Permit for Earth Movement to Greenwood-Andover Development LLC, applicable to the property earlier described, and subject to the following conditions which are the same as those imposed on the aforementioned definitive subdivision plan:

Conditions of Approval:

General Conditions

1. For purposes of this approval the subdivision shall be defined as all features depicted on

the plans described under condition number 2; the developer shall be defined as the applicant, Greenwood-Andover Development LLC, and its assigns or successors in title to the development, and all contractors and subcontractors under control of or in service to the developer;

2. Except as otherwise provided for in these conditions the construction of the subdivision and all activities associated therewith shall be in conformance and compliance with the information, details, notations, grading and features shown on the following plans and drawings prepared by DK Engineering Associates, Inc:

    a. Sheet 1 of 8, Title Sheet, dated 7/15/10 last revised 9/17/10, as prepared by DK Engineering Associates, Inc;

    b. Sheet 2 of 8, Existing Conditions Plan, dated 7/15/10 last revised 9/17/10, as prepared by DK Engineering Associates, Inc;

    c. Sheet 3 of 8, Definitive Subdivision Plan, dated 7/15/10 last revised 9/17/10, as prepared by DK Engineering Associates, Inc;

    d. Sheet 4 of 8, Grading Plan, dated 7/15/10 last revised 9/17/10, as prepared by DK Engineering Associates, Inc;

    e. Sheet 5 of 8, Grading Plan, dated 7/15/10 last revised 9/17/10, as prepared by DK Engineering Associates, Inc;

    f. Sheet 6 of 8, Plan & Profile, dated 7/15/10 last revised 9/17/10, as prepared by DK Engineering Associates, Inc;

    g. Sheet 7 of 8, Detail Sheet, dated 7/15/10 last revised 9/17/10, as prepared by DK Engineering Associates, Inc;

    h. Sheet 8 of 8, Detail Sheet, dated 7/15/10 last revised 9/17/10, as prepared by DK Engineering Associates, Inc;

    i. Sheet 1 of 1, Landscape & Screening Plan, dated 8/23/10, as prepared by DK Engineering Associates, Inc;

3. Original mylar prints of the above mentioned plans must be submitted for endorsement to the Planning Division within 30-days following the statutory 20-day appeal period.

4. Sheet 3 of the plan set entitled "Definitive Subdivision Plan" dated 7/15/10 last revised 9/17/10 as prepared by DK Engineering Associates, Inc; and an instrument containing these conditions, shall be recorded at the North Essex Registry of Deeds pursuant to the requirements of the Subdivision Rules and Regulations of the Andover Planning Board;

5. Prior to the recording of the definitive plan, the applicant shall provide to the Planning Department a digital file containing the plan if produced using computer aided drafting and design (CADD) software. The file format shall be in AutoCAD DWG (or ASCII DXF) version 2004 or earlier and Adobe PDF, delivered on CD-ROM or DVD-R media AutoCAD file delivery shall be in full model view and individual sheet views. The digital file shall include property boundaries, dimensions, easements, rights-of-way, edge of pavement, edge of sidewalk, edge of water bodies, wetland boundaries, topographic contours, spot elevations, parking areas, road centerline and associated text. Said digital data shall be delivered in the Massachusetts Coordinate System, North American Datum 1983 and North American Vertical Datum 1988, in U.S. Survey Feet. A review of the digital file shall be made by the Department of Public Works prior to the recording of the definitive plan.

6. This subdivision approval is limited to nine (9) building lots as shown on the plan referenced above;

7. The owner and applicant shall, pursuant to statute, have twenty (20) days following the approval action of the Andover Planning Board to file an appeal of said action, and in the absence of an appeal shall be deemed to have accepted said action and these conditions;

8. Within five (5) days of any transfer of ownership of this subdivision, in whole or in part, the developer shall notify the Andover Planning Department of the name and address of the new owner(s). The developer shall provide the new owner(s) with a copy of these conditions;

9. No permits for building may be issued by the Inspector of Buildings for any lot within this subdivision unless and until the provisions of Section V.E. of the Rules and Regulations of the Board have been satisfied. Once a building permit has been issued for any particular lot this condition will be deemed to have been complied with and considered released for that lot;

10. Any blasting operations shall require proper permits, and may not be undertaken on any weekend or holiday;

11. All grading and earth disturbance within the subdivision shall be governed by Sections VI.F.6., and VI.F.7. of the Rules and Regulations of the Board, as well as the Special Permit for Earth Movement SP10-04;

12. Import or export of earth materials from within the subdivision is prohibited except as may be provided for under special permit issued under Planning Board Decision SP10-04, or as otherwise allowed under the applicable provisions of the Zoning Bylaw;

13. Yard sprinklers or other privately owned underground devices shall not be installed within the roadway or utility easements, nor shall private recreational features be allowed within the roadway. Landscaping within the roadway in the form of grass, flowers, and

small shrubbery is permitted at the risk of the lot owner, provided that such landscaping does not interfere with the use or safety of the roadway;

14. Except as herein waived, the subdivision shall be constructed in accordance with and subject to all applicable provisions of the Rules and Regulations of the Board. The approval and these conditions shall be enforced under the provisions of Section V.H. of the Rules and Regulations of the Board;

15. Prior to the recording of the definitive plan at the Registry of Deeds the developer shall provide the Planning Department with a municipal lien certificate indicating that all taxes, assessments and charges have been paid in full as required by MGL, Chapter 60, Section 23;

16. Deeds for all building lots, as shown on the plan shall reserve the fee and/or interest in the streets and/or easements, said fee and/or interest to be conveyed to the Town at the time of street acceptance;

Prior to Construction

17. The developer must apply for a tree hearing to remove any trees located within Greenwood Road and/or Chandler Road right of way. Should the determination by the Tree Warden necessitate a modification of the entrance or drain lines the applicant is required to apply for a modification from the Planning Board;

18. Prior to any construction activity of any kind within the subdivision the developer shall submit for review and approval to the Planning Department a proposed construction sequence schedule, said schedule to be used as a guide to activities within the development including construction of roadways, utilities, drainage systems, stabilization, and stockpiling. This schedule once established shall not be deviated from, but may for good and demonstrated reason, be modified by agreement between the developer and the Planning Department;

19. Construction traffic associated with this subdivision shall be regulated by the Inspector of Buildings. Prior to commencing hauling operations, a hauling route shall have been reviewed and approved by the Inspector of Buildings. Any deviation from the approved route and/or scheduling once established shall require proper notification and approval from the Inspector of Buildings. Construction traffic shall be defined as large trucks hauling earth moving equipment, dump trucks, trucks hauling building materials, cement trucks, and contractors' vehicles larger than panel trucks.

20. Hauling of earth materials and heavy equipment on the Greenwood or Chandler Road is restricted to the time period between the last morning pick-up of school children, and the first afternoon drop off. It shall be the developer's responsibility to inform all contractors, subcontractors, vendors, and workmen of this restriction, which shall be enforced under the provisions of Section V.H. of the Board's Rules and Regulations;

21. Prior to any construction activity of any kind within the subdivision the developer shall submit for review and approval to the Planning Department a detailed schedule of the anticipated earth operations;

22. Prior to introduction of construction equipment onto the site a meeting shall be conducted between the developer, the developer's contractors, and the Planning Department, as well as the Department of Public Works for the purpose of reviewing these conditions and the construction sequence schedule;

23. Prior to any construction activities, the documents establishing the Homeowners' Association must be reviewed by Town Counsel, approved by the Planning Board and recorded at the Essex North Registry of Deed. The account referred to in section 23c shall have been established and funded in a manner prescribed by the town. The Homeowners' Association documentation shall provide for:
    a. The maintenance, inspections and upkeep of the stormwater facilities on site and off site;
    b. Compliance with the latest Operation and Maintenance Plan;
    c. The establishment of an account in an amount recommended by the Town Engineer and approved by the Planning Board and secured in a manner and form approved by the Board. Following establishment, the developer shall provide the Planning Department with written proof that said account has been established running to the benefit of the Homeowners' Association. The account established shall be kept for the purpose of maintenance, repair and/or restoration of said items with a minimum balance as recommended by the Town Engineer to be maintained at all times.
    d. The terms and method of assessments; the method of drawing on such funds; shall restrict any alteration of those facilities; shall indemnify the Town from any responsibility or liability for maintenance and operation of those facilities; and shall further provide that the Town will be reimbursed for any expenses incurred in the event the Town is required to perform any work in or on any of the facilities;
    e. The Town to have the right to make necessary repairs and lien the property owners, or use any other remedy available under the law to effect the same, in the event that any of the facilities are damaged to such an extent that they no longer perform their intended function, and such damage is not repaired by the Homeowners' Association within 90 days of such damage, The Town to be granted an easement to maintain and repair said facilities if necessary, but all financial responsibility for any such repairs, inspections and maintenance shall be solely that of the Homeowners' Association and all lot owners by virtue of their interest in said association;

24. Once paved, the roadway Weeping Willow Drive shall be kept clear and passable at all times. No equipment shall be parked in such a manner as to render the roadway

impassable, and no refuse containers, trailers, or construction materials of any kind shall be placed or stored upon the street nor within the cul-de-sac island;

Throughout Construction

25. Construction equipment or materials shall not be parked, stored, or placed in any area directly adjacent to or upgradient of any drainage channel or wetland area, nor in any cul-de-sac island. Repairs and maintenance to equipment shall be conducted in areas where no spills or leakage of fuels or other fluids could pose a pollution hazard;

26. Earth disturbed by construction activities associated with the roadway or easements, such as tree cutting, stump grubbing, cutting, filling, and regrading, shall be appropriately stabilized by methods determined by the Planning Department within sixty (60) days of such disturbance unless otherwise approved by the Planning Department;

27. No building lot shall remain in an open condition longer than sixty (60) days. "Open" shall be defined as that period of time between initial preparation of the lot for building (clearing of trees, stripping of topsoil), and the time that the foundation has been installed, backfilled, and the rough grading has been established and stabilized by use of temporary seeding, mulching, or netting. This restriction shall remain in force until the lot has been properly stabilized and shall survive changes in ownership of the lot;

28. Stockpiles of earth materials shall not be permitted in any area, which necessitates removal of trees for such purpose, nor within fifty (50') feet of any wetland boundary, drainage channel, or watercourse. Stockpiles shall be designated on a plan, which shall be submitted to the Planning Department, said locations to be determined by the developer and approved by the Planning Department. Stockpiles shall be prohibited in areas which have not been approved by the Planning Department;

29. Long term (more than sixty days) stockpiles of earth materials shall be shaped and secured by butted haybales around the perimeter, and shall be promptly stabilized by temporary seeding or netting;

30. Burial or burning of vegetation, stumps, or construction debris is strictly prohibited anywhere within the subdivision. Such materials shall be removed and properly disposed of off the site;

31. All construction activities within the subdivision shall be confined between the hours of 7:00 a.m., and 6:00 p.m., Monday through Friday, unless otherwise approved by the Planning Board. Once fully framed, interior construction related activities are allowed on Saturdays between 8:00 a.m. and 6:00 p.m. unless otherwise restricted or prohibited by the Inspector of Buildings in response to complaints. Construction activities include the transport of equipment, materials and supplies to and from the subdivision;

32. As field conditions warrant, berms of type and design and/or side under drains as specified by the Department of Public Works shall be installed in locations determined by the written decision of the Director of Public Works;

33. Construction activities on individual lots shall be conducted in a workmanlike manner at all times. Blowing dust or debris shall be controlled by the developer of lots through stabilization, wetting down, and proper storage and disposal methods;

Prior to Clearance Certificates

34. Prior to issuance of Clearance Certificates for any lot in the subdivision the 20' Wide Public Utility easement over Lots 5, 6, 7 and 9 shall be reviewed by Town Counsel to be granted to the Town and recorded at the Essex North Registry of Deeds;

35. Prior to issuance of Clearance Certificates for Lots 6 or 7 in the subdivision the 30' wide private utility easements shall be granted to the respective lots and recorded at the Essex North Registry of Deeds;

36. Prior to issuance of Clearance Certificates for Lots 3 and 4, a deed restriction which shall run with the land shall be placed on each of Lots 3 and 4. The restriction shall prohibit in perpetuity any and all disturbance within the 15 foot no cut zones on said lots as shown on Sheet 1 of 1 Landscape & Screening Plan. Said deed restriction will not prevent the planting of up to 10 spruce trees also depicted on Sheet 1 of 1 Landscape & Screening Plan dated 8/23/10. Prior to planting the final locations of these trees shall be determined in the field by staff. Said deed restriction shall have been reviewed by Town Counsel and recorded at the Essex North Registry of Deeds;

37. Immediately following the installation of water lines, the developer shall prepare a plan pursuant to Sections VII.W.3., and VIIW.4. of the Subdivision Rules and Regulations showing the location of all service connections to the building lots. No Clearance Certificate for any lot shall be issued until said plan has been submitted to the Department of Public Works;

38. Prior to the issuance of clearance certificates, the applicant shall submit to the Planning Department digital files of as-built plans of the features listed above, including utilities and approximate building location, following the format described in # 4 above;

39. Prior to the issuance of a Clearance Certificate for any lot, the limit of disturbance shown on sheet 4 of 8 of said plan shall have been clearly marked on the ground on the subject lot, and said marking shall consist of siltation fencing, surveyor's flagging, ribboned stakes at appropriate intervals, and/or a combination of such devices as determined suitable by the Planning Department. This condition may not be released until an occupancy permit has been issued at which time this condition will be deemed satisfied;

40. Prior to the issuance of a Clearance Certificate for any lot, all utilities as shown on sheet 4 of 8, including all off-site improvements shall have been fully constructed and approved by the Department of Public Works. Immediately following the installation of said utilities, the developer shall prepare as-built plans pursuant to Section VII.W. of the Rules and Regulations Governing the Subdivision of Land in Andover;

41. Prior to release of any Clearance Certificates for building purposes, a sign depicting "Weeping Willow Drive" shall have been erected at a location determined by the Department of Public Works;

42. Prior to the conveyance of individual lots and clearance certificates for any lot the grading as shown on Sheet 5 of 8 of the approved plans must be in place;

43. Prior to the conveyance of individual lots within the subdivision the developer shall provide the Planning Department with a surveyor's certification that temporary lot corners have been established on the ground for the lot to be conveyed. Once established, maintenance of these temporary corners shall be the responsibility of the lot owner. Upon completion of the street, and prior to the final release of any performance guarantee held, the developer shall provide the Planning Department with a surveyor's certification that all bounds and corners have been set in accordance with Section VII.U. of the Rules and Regulations of the Board;

44. The drainage areas, inlets, outlets and all associated piping shown on the plans shall be fully constructed, stabilized and operational prior to pavement of the streets and development of any house lot;

Specific Conditions

45. As agreed upon by the applicant, Greenwood-Andover Development LLC has offered to provide for the planting of up to 8 arborvitaes and 3 spruce trees on the property of 207 Greenwood Road (Map 129 Lot 6) as shown on Sheet 1 of 1 Landscape & Screening Plan. Prior to final release of performance guarantees held, the applicant shall send via certified mail, with a copy being transmitted to the Planning Division, a proposed landscaping plan for the land area in question. The landscaping plan shall identify the number of arborvitaes and spruce trees to be installed and their specific locations. Whereas the area in question is located on private property, if the current owner of 207 Greenwood Road (Map 129 Lot 6) elects not to accept the additional landscaping or does not respond to the developer's inquiry within 30-days of said communication, this condition shall be considered satisfied and the applicant shall not be required to provide additional screening.. Any deviation of the offered landscaping scheme shall be mutually agreed upon between the applicant and present property owner of 207 Greenwood Road (Map 129 Lot 6);

46. As agreed upon by the applicant, Greenwood-Andover Development LLC has offered to reconstruct/relocate the driveway of 206 Greenwood Road (Map 129 Lot 14) to access off

of Weeping Willow Drive as shown on Sheet 1 of 1 Landscape & Screening Plan. Prior to final release of performance guarantees held, the applicant shall send via certified mail, with a copy being transmitted to the Planning Division, a proposed plan for the driveway construction and removal of existing driveway. Whereas the area in question is located on private property, if the current owner of 206 Greenwood Road (Map 129 Lot 14) elects not to accept the reconstruction of the driveway or does not respond to the developer's inquiry within 30-days of said communication, this condition shall be considered satisfied and the applicant will not be required to provide an alternate driveway access.

The Board further grants the following waiver as it is in the public interest and not inconsistent with the intent and purpose of the Subdivision Control Law:

The Board grants the waiver of Article XIII, Sec. III.E.3.c-Original Mylars. Approval of this waiver shall be contingent upon an original mylar plan being submitted for endorsement to the Planning Division within 30-days following the statutory 20-day appeal period. Deferring the submission of original mylars until after approval and appeal periods has become standard Board practice.

Following the statutory twenty-day appeal period, and in the absence of any appeal, the plan and an instrument containing the foregoing restrictions will be filed in the Registry of Deeds. The applicant is responsible for the costs associated with the Registry filings.

On September 28, 2010, at a regularly scheduled public meeting, the Andover Planning Board voted (5-0) to issue the foregoing Special Permit for Earth Movement.

Date: 10-1-10

Joan Duff, Chair

COMMONWEALTH OF MASSACHUSETTS

Essex, ss

Date: 10-1-10

On this 1st day of October, 2010, by Joan Duff, the authorized agent of the Andover Planning Board, proved to me through satisfactory evidence, to be the person whose name is signed on the preceding or attached document, and who swore or affirmed to me that the documents are truthful and accurate to the best of her knowledge and belief and who acknowledged to me that she signed it voluntarily for its stated purpose and acknowledged the foregoing to be the free act and deed of the Andover Planning Board.

Before me,

Jacki Byerley, Notary Public

My commission Expires: July 4, 2014

CERTIFICATION

I, Lawrence Murphy, Town Clerk of the Town of Andover, Massachusetts, do hereby certify that twenty (20) days have elapsed since this decision of the Andover Planning Board was filed in my office on Oct 1, 2010 and no appeal against said decision has been filed.

Date: Oct 26, 2010

Town Clerk

XFINITY Connect

staceyandjoe@comcast.net
+ Font Size -

Ledge Road Gate

From : Stacey&Joe <staceyandjoe@comcast.net> Fri, May 05, 2017 09:23 PM

Subject : Ledge Road Gate

To : Marc Fournier <marc.fournier@andoverma.gov>

Cc : andrew flanagan <andrew.flanagan@andoverma.us>, ccronin@andoverma.gov, John Manglaratti <jmanglaratti@andoverma.gov>

Good evening,

We just arrived home not long ago and noticed that the gate to the landfill on the Greenwood side was open. Can you please see that it gets closed ASAP as the other gate to the materials area is open. This continues to be an ongoing problem.

Thank you ,
Stacey Albuquerque

XFINITY Connect

staceyandjoe@comcast.net
+ Font Size -

RE: Again...

From : Marc Fournier <RFournier@andoverma.gov>

Wed, Mar 08, 2017 07:40 AM

Subject : RE: Again...

To : Stacey&Joe <staceyandjoe@comcast.net>

Cc : Christopher Cronin <ccronin@andoverma.gov>, Andrew Flanagan <aflanagan@andoverma.gov>

Hi Stacey-

Good morning. We'll do some research to see who has left this gate open and get it resolved.

And yes, the loads are supposed to be covered. We'll check on this, too.

Take care,

Marc

Marc Fournier, MCA, LEED AP
Deputy Director of Public Works/Highway Superintendent
Dept. of Municipal Services
397 Lowell Street
Andover, MA 01810-4416
(978) 623-8714
(978) 806-6563 (cell)
marc.fournier@andoverma.gov

-----Original Message-----
From: Stacey&Joe [mailto:staceyandjoe@comcast.net]
Sent: Wednesday, March 08, 2017 6:48 AM
To: Marc Fournier <RFournier@andoverma.gov>
Cc: Christopher Cronin <ccronin@andoverma.gov>; Andrew Flanagan <aflanagan@andoverma.gov>
Subject: Again...

Good morning,

For the second evening in a row, we came home last night to find the gate open again to the Ledge Road Landfill on the Greenwood side (picture below). Can we make sure this gets closed on a regular basis at the end of the work day? Essentially, it has been since open since Monday am. There are numerous landscaping contractors and similar contractor like trucks who travel Greenwood and can easily dump anything inside this gates when they are open. I know in the past you have said that illegal dumping is a problem, this open gate is not going to help.

In addition, I have a question about the transport of materials by yellow DPW dump trucks, specifically last Tuesday 2/28 sometime before noon. I was backing out of my driveway and noticed one of these trucks going by down Greenwood toward the same landfill entrance that's visible in the picture . The truck was filled with dirt and rocks and some of the the contents (small rocks and dirt) were flying off the top of the load of the back of truck as it was moving and fell onto the road below. Fortunately, they were no cars driving behind the truck or runners or bikers nearby. Are the town trucks supposed to used a tarp over the back load so this does not happen? The other numerous private contractors that travel the Greenwood ,Chandler Road , North street area always have their loads covered . Please let me know.
Thanks,
Stacey Albuquerque

XFINITY Connect

staceyandjoe@comcast.net
+ Font Size -

RE: Gate open to ledge rd and NOI site walk date

From : Marc Fournier <RFournier@andoverma.gov> Wed, Dec 21, 2016 08:27 AM

Subject : RE: Gate open to ledge rd and NOI site walk date

To : Stacey&Joe <staceyandjoe@comcast.net>

HI Joe-

How are you? Tx for the heads up. We'll close it.

And we'll let you know when the site walk is rescheduled. The ConComm will decide on a date at their meeting on 1/3/17.

Happy holidays to you and Stacey, too!

Take care,

Marc

Marc Fournier, MCA, LEED AP
Deputy Director of Public Works/Highway Superintendent
Dept. of Municipal Services
397 Lowell Street
Andover, MA 01810-4416
(978) 623-8350 Ext. 518
(978) 806-6563 (cell)
marc.fournier@andoverma.gov

-----Original Message-----
From: Stacey&Joe [mailto:staceyandjoe@comcast.net]
Sent: Wednesday, December 21, 2016 7:18 AM
To: Marc Fournier <RFournier@andoverma.gov>
Subject: Gate open to ledge rd and NOI site walk date

Good morning Marc,

Not sure if you were aware, but the gate to Ledge Rd has been open overnight for the last 3 days.

Also, could you please let me know when the Ledge road NOI site walk will take place? This was recently discussed at the Conservation Commission.

Happy holidays
Thanks
Joe Albuquerque

XFINITY Connect

staceyandjoe@comcast.net
+ Font Size -

Gate open again

From : Stacey&Joe <staceyandjoe@comcast.net> Sat, Sep 10, 2016 05:07 PM

Subject : Gate open again

To : Marc Fournier <marc.fournier@andoverma.gov>

Cc : Chris Cronin <ccronin@andoverma.gov>, Andrew Flanagan <andrew.flanagan@andoverma.us>

Good evening,

The gate to ledge road off Greenwood is open again. How can this be considered a secure location if the gate if left open frequently? Can someone please make sure it's properly secured ASAP for public safety and to prevent illegal dumping.

Have a great weekend!

Thank you
Stacey and Joe

From: <Stacey.Albuquerque>
Date: June 30, 2016 at 9:40:55 AM EDT
To: Marc Fournier <marc.fournier@andoverma.gov>, Chris Cronin <ccronin@andoverma.gov>
Subject: Illegal dumping

Good morning,

I came across this illegally dumped chair near just before the parking lot area near baseball field during a walk this morning. Can you please send someone to dispose of it properly? It's absolutely disgusting.
See pic below

Thank you!
Stacey Albuquerque

XFINITY Connect

staceyandjoe@comcast.net
+ Font Size -

Re: Ledge road gate

From : Marc Fournier <marc.fournier@andoverma.gov>

Sat, Jun 18, 2016 06:07 PM

Subject : Re: Ledge road gate

To : Stacey&Joe <staceyandjoe@comcast.net>

Hi you guys-

How are you? We've had someone working there. I'll check it in a while.

Tx,

Marc

Sent from my iPhone

> On Jun 18, 2016, at 4:08 PM, Stacey&Joe <staceyandjoe@comcast.net> wrote:
>
> HI Marc
>
> Just wanted to let you know that the gate to the ledge rd has been open all day Saturday.
>
> Thanks
> Joe Albuquerque

XFINITY Connect

staceyandjoe@comcast.net
+ Font Size -

Ledge Road Gate open again

From : Stacey&Joe <staceyandjoe@comcast.net> Tue, Apr 12, 2016 07:19 PM

Subject : Ledge Road Gate open again

To : Fournier Marc <marc.fournier@andoverma.gov>

Cc : Wright Brad <Bradwright3@mac.com>, Hayes Ed <edhayes42@gmail.com>, Minasian Greg <gminasian@verizon.net>, Hussey Brian <brianhussey@yahoo.com>

Hi Marc - Just noticed gate from Greenwood Road and Ledge open at 7:15 PM. Joe

XFINITY Connect

staceyandjoe@comcast.net
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Re: Gate at Ledge rd

From : Stacey&Joe <staceyandjoe@comcast.net>

Mon, Mar 14, 2016 05:04 AM

Subject : Re: Gate at Ledge rd

To : Marc Fournier <marc.fournier@andoverma.gov>

Cc : Brad Wright <Bradwright3@mac.com>, Ed Hayes <edhayes42@gmail.com>, Greg Minasian <gminasian@verizon.net>, Hussey Brian <brianhussey@yahoo.com>

Good Marc - Can you please let us know what the protocols are in place to ensure materials storage facility at Ledge Road is safe and secure. The gate has been opened all weekend long.

Best,
Joe

> On Mar 1, 2016, at 7:21 AM, Fournier, Marc <marc.fournier@andoverma.gov> wrote:
>
> HI Joe-
>
> How are you? Tx. Good seeing you and Stacey yesterday.
>
>
> Take care,
>
> Marc
>
> Marc Fournier, MCA, LEED AP
> Deputy Director of Public Works/Highway Superintendent
> Dept. of Municipal Services
> 397 Lowell Street
> Andover, MA 01810-4416
> (978) 623-8350 Ext. 518
> (978) 806-6563 (cell)
> marc.fournier@andoverma.gov
>
> -----Original Message-----
> From: Stacey&Joe [mailto:staceyandjoe@comcast.net]
> Sent: Tuesday, March 01, 2016 6:13 AM
> To: Fournier, Marc <marc.fournier@andoverma.gov>
> Subject: Gate at Ledge rd
>
> Good morning,
>
> Funny you asked about the gate yesterday.. It's open this morning as of 6:00 am ...
>
> Joe Albuquerque

XFINITY Connect

staceyandjoe@comcast.net
+ Font Size -

RE: Ledge road gate

From : Marc Fournier <marc.fournier@andoverma.gov>

Wed, Jan 06, 2016 07:12 AM

Subject : RE: Ledge road gate

To : Stacey&Joe <staceyandjoe@comcast.net>

Cc : Hayes Ed <edhayes42@gmail.com>, Hussey Brian <brianhussey@yahoo.com>, Minasian Greg <gminasian@verizon.net>, Wright Brad <Bradwright3@mac.com>

HI Stacey and Joe-

How are you? Tx for the information again. We are trying to figure out who is leaving this open.

Take care and Happy New Year to you, too!

Marc

Marc Fournier, MCA, LEED AP
Deputy Director of Public Works/Highway Superintendent
Dept. of Municipal Services
397 Lowell Street
Andover, MA 01810-4416

(978) 623-8350 Ext. 518
(978) 806-6563 (cell)
marc.fournier@andoverma.gov

-----Original Message-----
From: Stacey&Joe [mailto:staceyandjoe@comcast.net]
Sent: Tuesday, January 05, 2016 10:15 PM
To: Fournier, Marc
Cc: Hayes Ed; Hussey Brian; Minasian Greg; Wright Brad
Subject: Ledge road gate

HI Marc - Happy New Year! Stacey and I just got home and noticed that the Ledge Road gate was not closed again.

In addition, are the gates entering the stockpile area locked as well? Reason for this question is that kids in the past have gone up there to sled down the "hills" during the wintertime.

Thank you for your attention to this matter. Hope you and your family have a happy and healthy New Year.

Stacey & Joe

XFINITY Connect

staceyandjoe@comcast.net
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Fwd: Ledge road gate again!

From : Stacey&Joe <staceyandjoe@comcast.net>

Tue, Dec 01, 2015 05:59 PM

Subject : Fwd: Ledge road gate again!

To : Saxon Keith <ksaxon@aol.com>, Minaslan Greg <gminaslan@verizon.net>, Hayes Ed <edhayes42@gmail.com>, Hussey Brian <brianhussey@yahoo.com>, Wright Brad <Bradwright3@mac.com>

New protocol....

Begin forwarded message:

From: "Fournier, Marc" <marc.fournier@andoverma.gov>
Date: December 1, 2015 at 4:54:59 PM EST
To: Stacey&Joe <staceyandjoe@comcast.net>
Subject: Re: Ledge road gate again!

Hi you guys-

How are you? We have set up a new protocol and hopefully this won't be happening in the future...

Take care,

Marc

Sent from my iPad

On Nov 25, 2015, at 7:12 AM, Stacey&Joe <staceyandjoe@comcast.net> wrote:

Good morning Marc,

Hope all is well. We have been noticing that the gate had been open over the last few weeks. It has been open overnight multiple times over the past 3 weeks. It is now open and has been for the last 24-48 hrs.

Can you please make ensure that it gets locked?

Have a nice Thanksgiving.

Thanks

Joe Albuquerque

XFINITY Connect

staceyandjoe@comcast.net
+ Font Size -

Re: Ledge Road Gate

From : Marc Fournier <marc.fournier@andoverma.gov> Fri, Jun 19, 2015 08:04 PM

Subject : Re: Ledge Road Gate

To : Stacey & Joe <staceyandjoe@comcast.net>

Cc : Mary O'Donoghue <modonoghue@andoverma.gov>, Kevin Hale <khale@andoverma.gov>, Stephen Surette <ssurette@andoverma.gov>

Hi Stacey and Joe-

How are you? I'll make sure the guys lock it up. We been doing some work in there and they obviously forgot. Tx for the info.

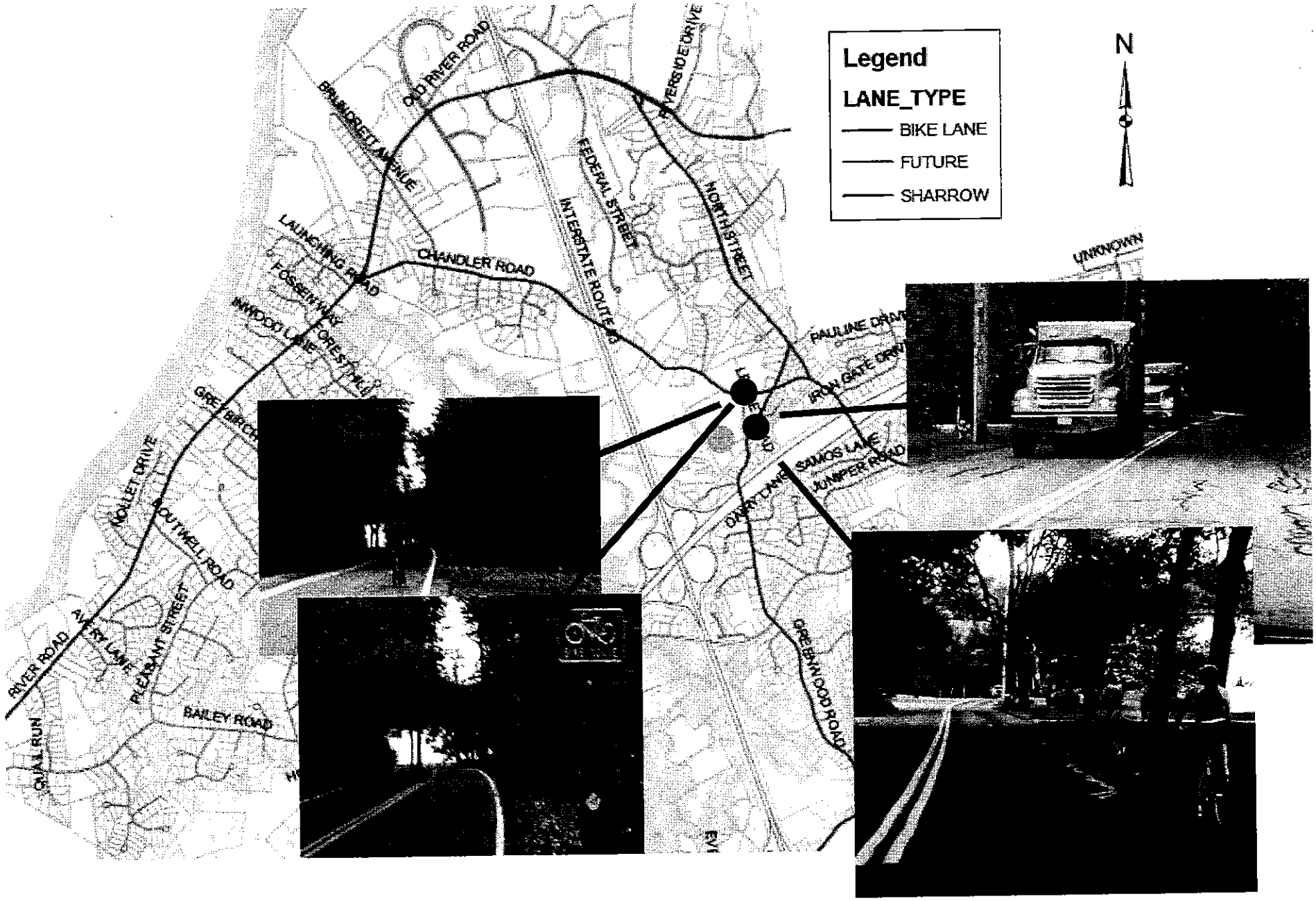
I hope you have a great weekend!

Marc

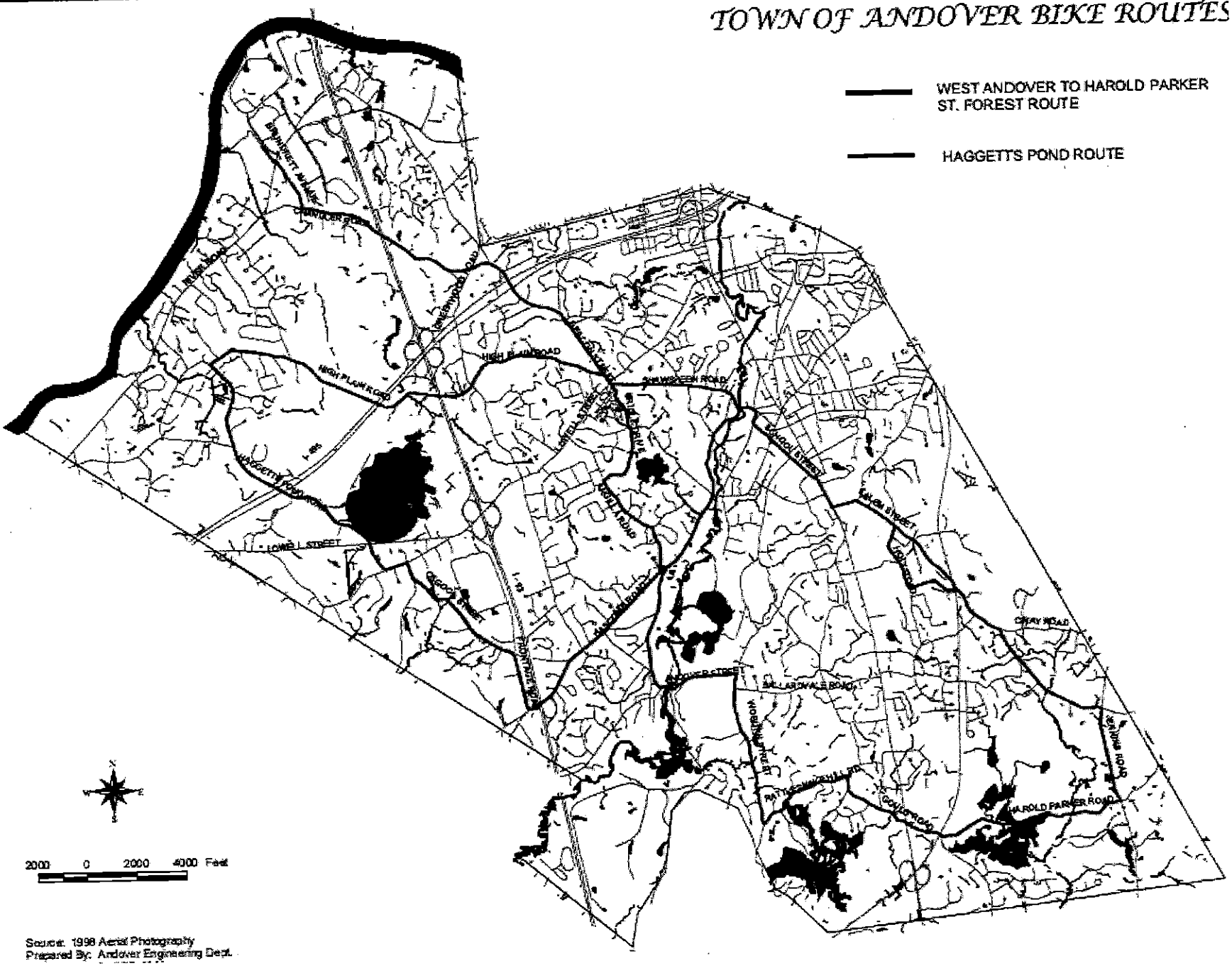
Sent from my iPhone

> On Jun 19, 2015, at 6:18 PM, Stacey & Joe <staceyandjoe@comcast.net> wrote:
>
> Hi Marc - Just wanted to give you a heads up, we have driven by Ledge Road gate entrance and have found it open several times since the night of the Special Meeting on the landfill. Here is a photo that I just took.
>
> <image1.jpeg>
>
>
> Nice to see you last evening. Have a nice weekend.
>
> Joe Albuquerque

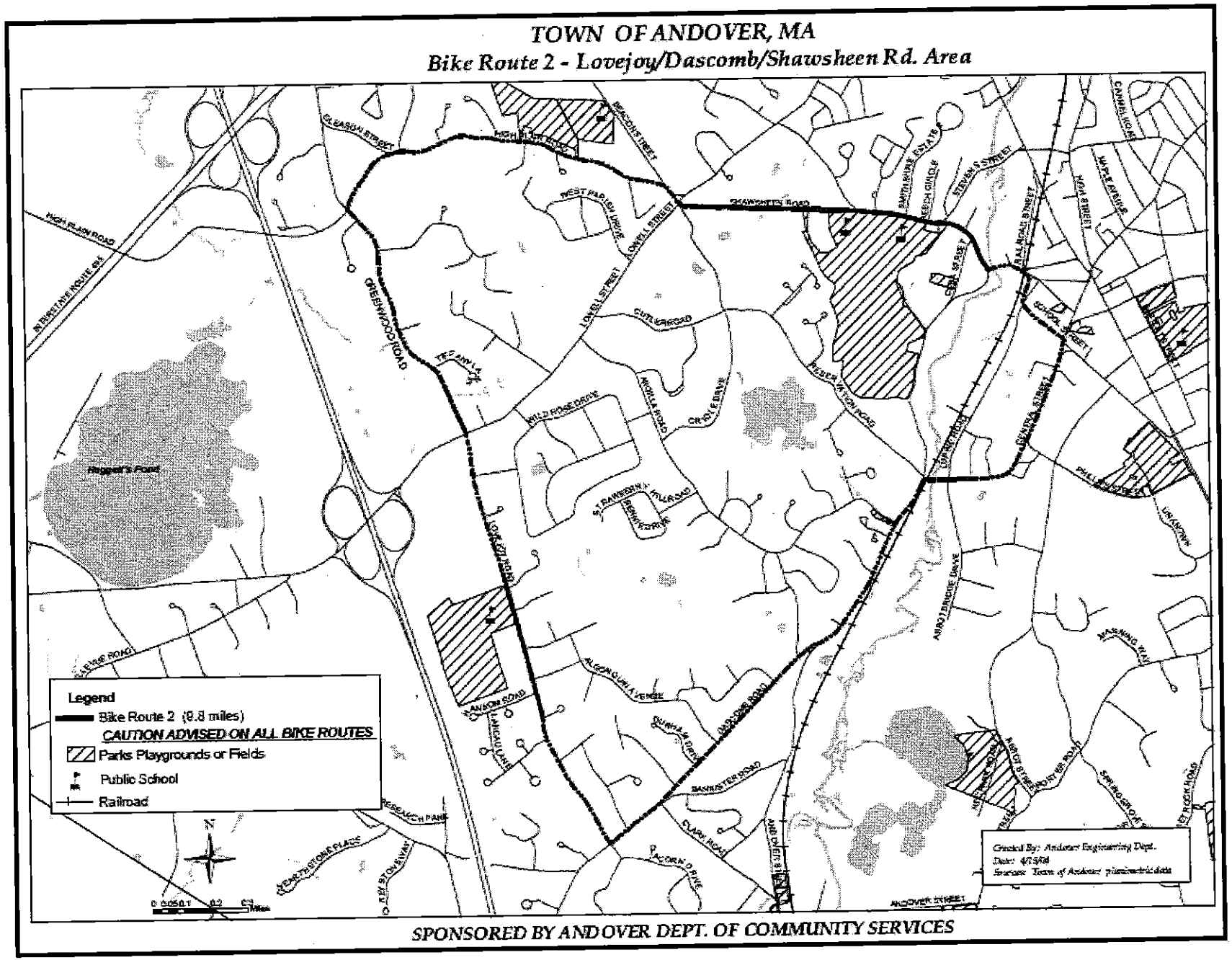
Andover Bike Route Plan 2013



Andover Bike Routes


TOWN OF ANDOVER BIKE ROUTES
WEST ANDOVER TO HAROLD PARKER ST. FOREST ROUTE
HAGGETTS POND ROUTE
2000 0 2000 4000 Feet
Source: 1998 Aerial Photography
Prepared By: Andover Engineering Dept.

Andover Bike Routes


TOWN OF ANDOVER, MA
Bike Route 2 - Lovejoy/Dascomb/Shawsheen Rd. Area
Legend
Bike Route 2 (0.8 miles)
CAUTION ADVISED ON ALL BIKE ROUTES
Parks Playgrounds or Fields
Public School
Railroad
SPONSORED BY ANDOVER DEPT. OF COMMUNITY SERVICES

Stacey&Joe <staceyandjoe@comcast.net> 5/5/2017 9:23 PM

Ledge Road Gate

To Marc Fournier <marc.fournier@andoverma.gov> Copy andrew.flanagan@andoverma.us • ccronin@andoverma.gov • John Mangiaratti <jmangiaratti@andoverma.gov>

Good evening,

We just arrived home not long ago and noticed that the gate to the landfill on the Greenwood side was open. Can you please see that it gets closed ASAP as the other gate to the materials area is open. This continues to be an ongoing problem.

Thank you ,
Stacey Albuquerque

Stacey&Joe <staceyandJoe@comcast.net> 9/20/2017 6:05 AM

Ledge road gate- security concerns

To Marc Fournier <rfournier@andoverma.gov> • Marc Fournier <marc.fournier@andoverma.gov> Copy
Kuillan Tang <ktang05@yahoo.com> • Jisung Roh <rohjlsung@hotmail.com> •
Eunsang Yoon <eunsang_yoon@uml.edu> • chingfatcheng@gmail.com <chingfatcheng@gmail.com> •
David Wang <dtwangyh@yahoo.com> • Ed Hayes <edhayes42@gmail.com> •
jay.g.liu@gmail.com <jay.g.liu@gmail.com> • gongjerry@gmail.com <gongjerry@gmail.com> •
judyzhutang@yahoo.com <judyzhutang@yahoo.com> •
kiki8820032003@yahoo.com <kiki8820032003@yahoo.com> •
nursekimmy1121@hotmail.com <nursekimmy1121@hotmail.com> •
luabooth@hotmail.com <luabooth@hotmail.com> • ritza66@gmail.com <ritza66@gmail.com> •
mttroxel@yahoo.com <mttroxel@yahoo.com> • sharl.fabiani@gmail.com <sharl.fabiani@gmail.com> •
simon_c_lam@yahoo.com <simon_c_lam@yahoo.com> •
Tom.Fabiani@converse.com <tom.fabiani@converse.com> • tdargahi@gmail.com <tdargahi@gmail.com> •
wenrongz@hotmail.com <wenrongz@hotmail.com> • inquiry168@verizon.net <inquiry168@verizon.net> •
carolminasian@verizon.net <carolminasian@verizon.net> • Gregory Minasian <gregory.minasian@outlook.com> •
Brad Wright <bradwright3@mac.com> • Brian Hussey <brianhussey@yahoo.com> •
Ed Fortuna <efortuna1@verizon.net> • Kumar Vipul <vipul686@gmail.com> •
Swamy Jay <swamyhousehold@gmail.com> • desai anish70 <anish70_desai@yahoo.com> •
Wright Julie <jlcorrell14@yahoo.com> • thomasebrady@gmail.com Blind copy Keith Saxon <ksaxon@aol.com> •
Keith Saxon <keith.m.saxon@gmail.com> • Heather Lauten <hlauten@comcast.net>

Good morning,

Can you please make sure that the Ledge road gate is closed at the end of each day? It has been open for 2 or 3 days in a row . It has been open at night as late as 10 pm and as early as 5:30 in the morning. This continues to be an ongoing problem.

Thanks
Stacey and Joe Albuquerque

Marc Fournier <mfournier@andoverma.gov> 10/24/2017 7:15 AM

RE: Illegally dumped TV

To Stacey&Joe <staceyandjoe@comcast.net> • Stephen Surette <ssurette@andoverma.gov>

Hi Stacey-

Good morning. Tx for letting us know and will do.

Take care,

Marc

Marc Fournier, MCA, LEED AP
Deputy Director of Public Works/Highway Superintendent
Dept. of Municipal Services
397 Lowell Street
Andover, MA 01810-4416
(978) 623-8350 Ext. 518
(978) 806-6563 (cell)
marc.fournier@andoverma.gov

-----Original Message-----
From: Stacey&Joe [mailto:staceyandjoe@comcast.net]
Sent: Tuesday, October 24, 2017 6:00 AM
To: Marc Fournier <MFournier@andoverma.gov>
Subject: Illegally dumped TV

Good morning,

There has been an illegally dumped old TV on the side of the road opposite the entrance to Trinity Court right outside the chain link fence to near the edge of the landfill . Can you please have it picked up and discarded appropriately?

Thanks !
Stacey Albuquerque

Stacey&Joe <staceyandjoe@comcast.net> 1/12/2018 8:46 PM

Gate open again

To ccronin@andoverma.gov • marc.fournier@andoverma.gov

Hi there,

Can we please get this gate closed ? It is 9 pm on a Friday eve and there is clearly no one working in there now. I thought if it supposed to be locked at all times.

Thanks
Stacey Albuquerque

Stacey&Joe <staceyandJoe@comcast.net> 5/7/2018 10:11 PM

Gate open again !!

To ccronin@andoverma.gov • tcarbone@andoverma.gov

Good morning Chris,

The Ledge road landfill gate on Greenwood has been open the entire weekend. In addition the chain link fence to the left of the gate is severely damaged not making this a secure area.

The area is also flooded more than usual and is not receding appropriately. There are also multiple old tires sitting in this pool of water which as you know encourages the breeding of mosquitoes.

This gate issue is ongoing for years and unfortunately is illustrating the town's inability to maintain a secure perimeter around this facility which is required until it's capped and closed. Greenwood is a fairly high traffic area with contractors landscapers, etc.
I have seen Town trucks go through the gate and not closing it behind them.

Can you let me know how these issues will be addressed asap.
1. Gate security
2. Tires and mosquitoes

Best
Stacey Albuquerque

Stacey&Joe <staceyandjoe@comcast.net> 5/29/2018 7:54 PM

Re: Tires and gate open again

To Marc Fournier <mfournier@andoverma.gov> Copy Christopher Cronin <ccronin@andoverma.gov> • Thomas Carbone <tcarbone@andoverma.gov> • Stephen Surette <ssurette@andoverma.gov> • Andrew Miller <millera@cdmsmith.com>

Thanks Marc,

Just as an FYI, we just got home and drove past the landfill ledge road entrance gate on Greenwood which is again open. I do not understand why it can't be closed on a regular basis, demonstrating that this area cannot be secured. It's very frustrating. Many times I have also seen the Andover Police checking out the open gate some early mornings. An open gate is inviting illegal dumping and or potential vandalism.

I would like an estimate on when the tires will be removed as you know mosquito season will be in full swing. I am sure the involvement with
CDM, Conservation Commission, and the Heath Department will facilitate their removal in a timely manner, but would like an idea when this will happen. In addition, there is an awful stench that is coming from that area as well. Not sure what that means .

Thanks
Stacey

On May 29, 2018, at 7:05 AM, Marc Fournier <MFournier@andoverma.gov> wrote:

> HI Stacey-
>
> Good morning. The area is already being monitored by Mosquito Control. We'll work with CDM Smith, Conservation, and the Health Department about removing tires in that area of the landfill that have worked their way to the surface.
>
> Take care,
>
> Marc
>
> Marc Fournier, MCA, LEED AP
> Deputy Director of Public Works/Highway Superintendent
> Dept. of Municipal Services
> 397 Lowell Street
> Andover, MA 01810-4416
>
> (978) 623-8350 Ext. 518
> (978) 806-6563 (cell)
> marc.fournier@andoverma.gov

From: Stacey&Joe [staceyandjoe@comcast.net]
Sent: Tuesday, May 29, 2018 6:34 AM
To: Marc Fournier <MFournier@andoverma.gov>
Cc: Christopher Cronin <ccronin@andoverma.gov>; Thomas Carbone <tcarbone@andoverma.gov>; Stephen Surette <ssurette@andoverma.gov>
Subject: Tires

Hi Marc

I was walking by the area across from Trinity court this morning and noticed the tires are more visible especially since the water has receded a bit. When will these tires be removed and will there be mosquito mitigation spraying, etc in that area?

Thanks
Stacey Albuquerque

On May 8, 2018, at 9:56 AM, Stacey&Joe <staceyandjoe@comcast.net> wrote:

> Thanks for the reply.
>
> What is the ETA for each of the component this work?
>
> Stacey
>
> On May 8, 2018, at 7:30 AM, Marc Fournier <MFournier@andoverma.gov> wrote:
>
> > Good morning Stacey and Joe-
> >
> > We have instructed our staff to close and lock this gate whenever they leave the landfill.
> >
> > FYI, the stormwater pipe in this area has failed. We believe it is located in trash and will be replaced as part of the landfill cap and closure project. Barring any additional delays, we hope to have our final permits soon and go to bid for this project this summer.
> >
> > We will work will Mosquito Control on this area and our staff will remove the tires that have been dumped illegally.
> >
> > We will also repair the gate and fence which were damaged during storms this winter.
> >
> > Take care,
> >
> > Marc
> >
> > Marc Fournier, MCA, LEED AP
> > Deputy Director of Public Works/Highway Superintendent
> > Dept. of Municipal Services
> > 397 Lowell Street
> > Andover, MA 01810-4416

(978) 623-8350 Ext. 518
(978) 806-6563 (cell)
marc.fournier@andoverma.gov

From: Stacey&Joe <staceyandjoe@comcast.net>
Date: May 7, 2018 at 10:11:22 PM EDT
To: ccronin@andoverma.gov, tcarbone@andoverma.gov
Subject: Gate open again !!

Good morning Chris,

The Ledge road landfill gate on Greenwood has been open the entire weekend. In addition the chain link fence to the left of the gate is severely damaged not making this a secure area.

The area is also flooded more than usual and is not receding appropriately. There are also multiple old tires sitting in this pool of water which as you know encourages the breeding of mosquitoes.

This gate issue is ongoing for years and unfortunately is illustrating the town's inability to maintain a secure perimeter around this facility which is required until it's capped and closed. Greenwood is a fairly high traffic area with contractors landscapers, etc.
I have seen Town trucks go through the gate and not closing it behind them.

Can you let me know how these issues will be addressed asap.
1. Gate security
2. Tires and mosquitoes

Best
Stacey Albuquerque

<image2.jpeg>

<image1.jpeg>

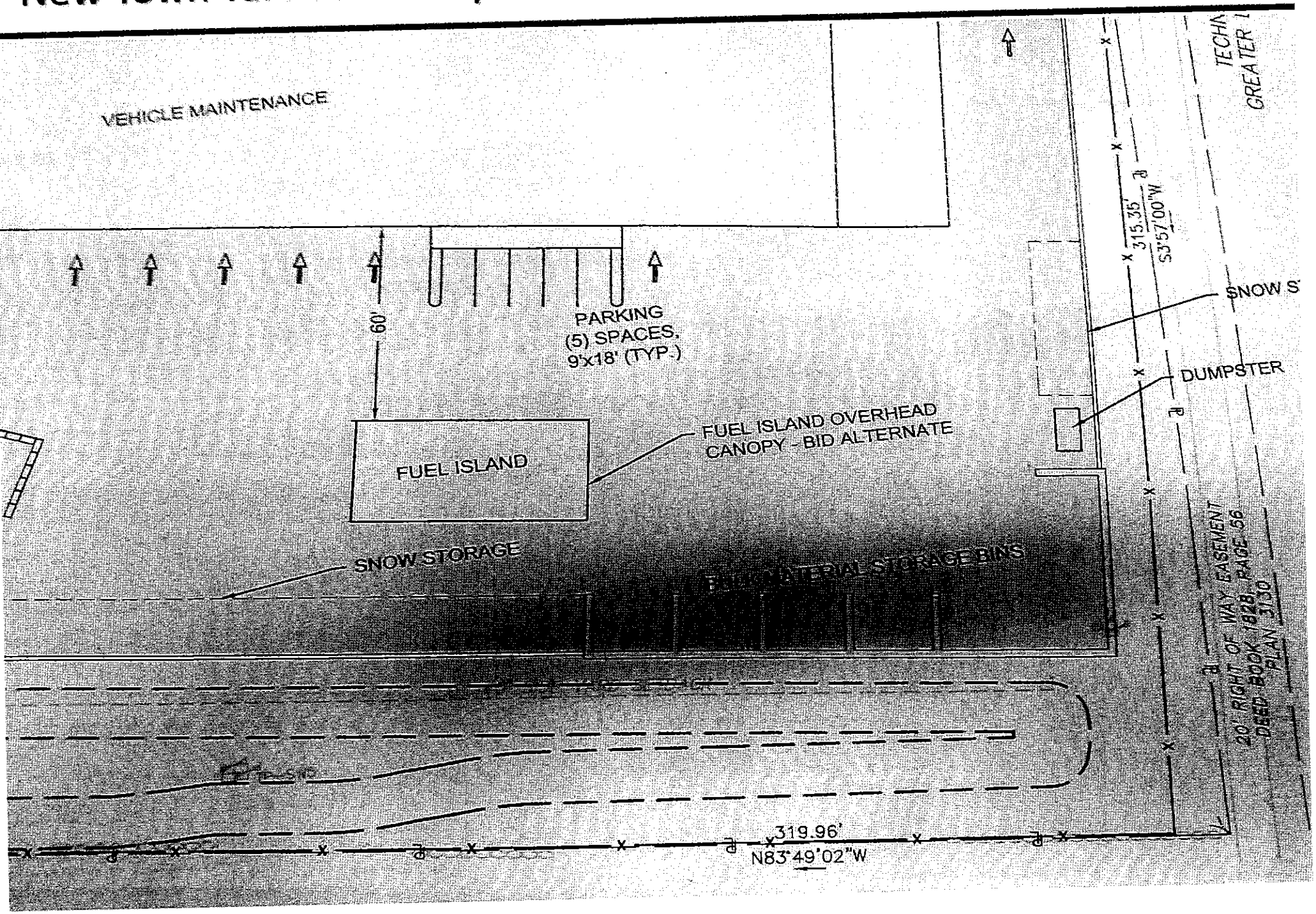
<image1.jpeg>

<image2.jpeg>

Comparison of Estimated Implementation Costs for Landfill Cap and Evaluated Post-Closure Uses

Post-Closure Use Option	Base Closure Cost	Incremental Implementation Costs		Total Cost
		Proposed Use	DPW Materials Handling Area	
Cap Only	$8.4M	$0	$0.8M	$9.2M
Active Recreation – replicate existing fields (includes fields, lighting, parking and appurtenances)	$8.4M	$3.3M to $4.6M	$0.8M	$12.5M to $13.8M
Active Recreation – flat grassed plateau (no parking, lighting nor appurtenances)	$8.4M	$1.7M to $2.9M	$0.8M	$10.9M to $12.1M
Solar PV Array (prepare site only; array by others)	$8.4M	$0	$0.8M	$9.2M

New Town Yard at 5 Campanelli – Plan Includes Materials Storage



Spieler, Richard (DEP)

From: Fairbrother, Mark (DEP)
Sent: Thursday, May 31, 2018 7:15 AM
To: Moeller, Roger (DEP)
Cc: Spieler, Richard (DEP)
Subject: Fwd: Andover, MA Ledge Road Landfill Closure - Comments
Attachments: facebook.png; ATT00001.htm; twitter.png; ATT00002.htm; linkedin.png; ATT00003.htm; twitter-white.png; ATT00004.htm; linkedin_profile.png; ATT00005.htm; Andover Ledge Road Landfill Closure_2018-0530.pdf; ATT00006.htm

Sent from my Verizon 4G LTE smartphone

-------- Original message --------
From: Brad Wright <bradwright3@mac.com>
Date: 5/30/18 10:16 PM (GMT-05:00)
To: "Fairbrother, Mark (DEP)" <Mark.Fairbrother@MassMail.State.MA.US>
Subject: Andover, MA Ledge Road Landfill Closure - Comments

Dear Mr. Fairbrother,

Please accept my attached comments for Application Transmittal Number: X275420 and FMF Number: 269388 regarding a DPW materials handling area in our watershed at Ledge Road Landfill.

Thank you.

-Brad

Brad Wright, CFP®
Board Of Directors 2018, Financial Planning Association of MA
310.508.7018 | BradWright3@mac.com | http://www.BradleyOnAir.com

Dear Mr. Fairbrother,

Please accept my public comments and concerns regarding the Ledge Road Landfill Closure Project in Andover (Application Transmittal Number: X275420 AND FMF Number 269388), due on or before 05/30/18.

The Ledge Road Landfill project has lacked vision, transparency and accountability since inception. The town of Andover officials decided, on their own, without input from residents or abutters to close, cap, and insert a municipal services facility in the middle of a residential neighborhood and adjacent to our town's water supply and to use taxpayer money in doing so. Andover also sells water from this same source to the town of North Reading. Town officials have adamantly opposed even considering other uses for this land. For example: Andover is in dire need of additional ball fields, which were recently taken away as part of this project. A solar farm is another possibility. At our two most recent annual Town Meetings, private warrant articles have passed which require the town to present options at a future Town Meeting prior to deciding on post closure use. The town refuses to adhere to either town meeting vote or residents in general.

The surrounding streets are narrow without sidewalks, with blind curves and hills and are not safe for the heavy municipal trucks and materials that DPW intends to store at the facility. Heavy machinery would also reduce the air quality and add noise pollution, again in a residential neighborhood. I have two children, ages 10 and 7. My eldest suffers from ongoing respiratory issues and uses an inhaler. Please see the following study summaries to get a feel for how she, and others, could be affected.

- *Ambient air pollution is a health hazard to children:*

  Outdoor air pollution is now recognized as an important problem, both nationally and worldwide. Children and infants are among the most susceptible to many of the air pollutants. Recent studies have found links between air pollution and respiratory symptoms, asthma exacerbations/hospitalizations, preterm births, infant mortality, deficits of lung growth, and possibly, development of asthma. This policy statement from American Academy of Pediatrics concludes with recommendations to the government on promotion of effective air pollution policies to ensure protection of children's health.

  Committee on Environmental Health, et al. (December 2004). Ambient Air Pollution: Health Hazards to Children. PEDIATRICS, Volume 114, No. 6: 1699-1707.

- *The American Academy of Pediatrics' Summary of Findings:*
  - Air Pollution and Human Health: Scientific experts now believe the nation faces an epidemic of illnesses that are exacerbated by air pollution. These illnesses include cardiovascular disease, asthma and lung cancer.
  - Children at Special Risk: They have concluded that levels of ozone and particulate matter are high enough in many parts of the US to threaten children's health.
  - Elderly at Special Risk: Cardiovascular disease, hypertension, diabetes and cancer are all illnesses disproportionately borne by the elderly.

- Diesel Exhaust: Diesel exhaust is especially dangerous, containing nearly 40 hazardous pollutants. These fine particles may be deeply inhaled into the lung and carry with them a collection of attached hazardous compounds. Diesel emissions increase the severity and duration of asthma attacks.
- Diesel Emissions: It recommends that children's exposure to diesel exhaust particles should be decreased and that idling of diesel vehicles in place where children live and congregate should be minimized to protect their health.

- *Asthma symptoms caused by truck exhaust*

A study was conducted in Munster, Germany to determine the relationship between truck traffic and asthma symptoms. In total, 3,703 German students, between the ages of 12-15 years, completed a written and video questionnaire in 1994-1995. Positive associations between both wheezing and allergic rhinitis and truck traffic were found during a 12 month period. Potentially confounding variables, including indicators of socio-economic status, smoking, etc., did not alter the associations substantially.

Duhme, H., S. K. Weiland, et al. (1996). The association between self-reported symptoms of asthma and allergic rhinitis and self-reported traffic density on street of residence in adolescents. Epidemiology 7(6): 578-82.

- *Truck traffic linked to childhood asthma hospitalizations*

A study in Erie County, New York (excluding the city of Buffalo) found that children living in neighborhoods with heavy truck traffic within 200 meters of their homes had increased risks of asthma hospitalization. The study examined hospital admission for asthma amongst children ages 0-14, and residential proximity to roads with heavy traffic.

Lin, Munsie, Hwang, Fitzgerald, and Cayo. (2002). Childhood Asthma Hospitalization and Residential Exposure to State Route Traffic. Environmental Research, Section A, Vol. 88, pp. 73-81.

- *Evidence shows respiratory effects of diesel traffic exposure in asthma*

Air pollution from road traffic is a serious health hazard and particulates from diesel exhaust have become cause for increasing concern. Study investigated the effects of short-term exposure to diesel traffic in people with asthma in an English urban, roadside environment. Conclusions served as a demonstration and explanation of the epidemiologic evidence that associates the degree of traffic exposure with lung function in asthma.

Cullinan, M.D., Paul, et al. (2007). Respiratory Effects of Exposure to Diesel Traffic in Persons with Asthma. New England Journal of Medicine, Vol. 357, pp. 2348-58.

- *Exposure relationship between road traffic noise and coronary heart diseases*

  A meta-analysis of 14 studies on the association between road traffic noise and coronary heart diseases was carried out. The result of the meta-analysis complies quantitatively with the result of a recent meta-analysis on the association between road traffic noise and hypertension. Road traffic noise is a significant risk factor for cardiovascular diseases.

  Babisch, Wolfgang. (January-February 2014). Lin, Munsie, Hwang, Fitzgerald, and Cayo. (2002). Updated exposure-response relationship between road traffic noise and coronary heart diseases: A meta-analysis. Noise and Health.

I respectfully ask that your office reconsiders its decision in recent approval of Corrective Action Design and authorization to construct decision letter dated 04/30/18 related to the construction design for the surface of the DPW materials area by requiring the town to return to Town Meeting with options for post closure use and a proposal that is vetted for both physical and environmental safety and accepted by residents prior to construction or funding. I am simply requesting that the Town of Andover use common sense before forging ahead.

Thank you for your time.

Sincerely,

Brad Wright
189 Greenwood Road
Andover, MA 01810
(310) 508-7018

CDM Smith
75 State Street, Suite 701
Boston, Massachusetts 02109
tel: 617 452-6000
fax: 617 345-3901
cdmsmith.com

November 15, 2018

Mr. Mark Fairbrother
Section Chief, Solid Waste Management
Massachusetts Department of Environmental Protection
Northeast Regional Office
205B Lowell Street
Wilmington, Massachusetts 01887

Subject: Response to Public Comments
Provisional Decision – Issued 4/30/2018 – For Comment
Applications for Landfill Closure (BWP SW25) and Post-Closure Use (MWP SW36)
Ledge Road Landfill Closure Project, Town of Andover, Massachusetts
Transmittal # X275420 and Transmittal # X275730

Dear Mr. Fairbrother:

On behalf of the Town of Andover, CDM Smith Inc. (CDM Smith) has prepared this response to comments provided by the public regarding the Provisional Decision issued by the Massachusetts Department of Environmental Protection (MassDEP) on April 30, 2018, for the Corrective Action Design (CAD) (BWP SW25) and Post-Closure Use (MWP SW36) permit applications. These comments were provided to CDM Smith by MassDEP via email on July 5, 2018.

Several of the comments received were similar in nature, and others do not lend themselves to a typical comment-response format. Therefore, CDM Smith is providing general responses to each of the concerns raised by the comments, rather than responses to each comment individually.

Air Quality

The most frequent concern expressed in the public comments relates to potential air quality impacts during landfill closure construction as well as during post-closure use operations at the DPW materials handling area. Concerns include truck exhaust, airborne dust, odors, and landfill gas.

Truck exhaust – Construction of the landfill cap in accordance with MassDEP regulations will require bringing in a substantial amount of material. In support of the Massachusetts Environmental Policy Act (MEPA) Environmental Notification Form (ENF) filed for the project in August 2016, a CDM Smith traffic engineer evaluated available routes from interstate highways to be used as temporary truck routes during construction and identified four truck routes to reduce the impacts along any one route. The truck routes are shown on Figure 4-1 of the ENF submittal (see Attachment A). As required by the

ENF Certificate (included as Attachment B) and as discussed below, there are time of day restrictions on three of the four truck routes. These requirements and the truck route map are being incorporated into Specification Section 01170 (Special Provisions), which will be made part of the construction contract such that the construction contractor will be required to abide by them.

During post-closure operation of the upgraded DPW materials handling area, the number of truck trips are expected to be similar to current operations with improved access off Chandler Road.

Odors and airborne dust from wetland soil remediation – Commenters expressed concerns regarding potential impacts from odors and airborne dust that could be generated during remediation of the arsenic impacted wetlands soils. The potential for airborne dust from contaminated soil will be addressed during construction as follows: It is anticipated that the soils will be wet when excavated and will therefore need to be dried to the point where free liquids are no longer present. At that point, the wetland soils will be placed in the landfill and covered with clean material. If the wetland soils are excavated during an unusually dry period such that the soil is not moist, the soil will be sprayed with water to keep it moist during excavation so that airborne dust is not generated and will be placed immediately into the landfill and covered daily with clean material. These requirements are being incorporated into Specification Section 01110 (Environmental Protection Procedures), which requires the construction contractor to have water available onsite to control airborne dust from any construction operations, including wetland soil remediation.

Since the only contaminant in the wetland soil is arsenic, removal of the wetland soil and relocation to the landfill will not generate odors associated with contamination. Although it is true that wetland soils can exhibit an odor from natural organic material in the soil, these odors do not represent a public health concern. The construction contractor will be required to have masking agents available during waste relocation and these same masking agents can be used on wetland soils after removing from the resource area if odors become a nuisance. Odor control requirements are being included in Specification Section 01170 (Special Provisions). Also note that the proposed location for drying and disposing wetland soils is in the northwest portion of the site near the existing parking lot off Chandler Road, as far from residents as possible.

Landfill gas – As described in Section 6.3.3 of the CAD Report, the design includes construction of a landfill gas venting trench along the southern edge of landfilled waste, which will be located near new homes being constructed on Greenwood Road (Sheet C-22 through C-25). The trench will be vented every 100 feet to allow landfill gas that has migrated to the trench to escape (Detail 3 on Sheet D-7). One public comment expressed a concern that these vents, being located so close to residences, could present a public health issue and/or generate nuisance odors. The purpose of the landfill gas venting trench is to mitigate potential public health concerns associated with landfill gas migration beyond the

limits of the landfill property. The use of gas venting trenches to prevent gas migration is industry accepted practice and is recommended by the MassDEP Landfill Technical Guidance Manual. Due to the age of the waste (the Landfill stopped accepting waste in 1972), and with venting in place to prevent a buildup of landfill gas, any odors that might result from the venting trenches are expected to be infrequent and of short duration.

Public Safety

Comments express public safety concerns during construction due to the expected increased truck traffic in residential neighborhoods, particularly when children waiting for school buses will be present (note that increased truck traffic is not anticipated for the proposed post-closure use as the number of trucks per day is anticipated to be similar to the current number). Concern for public safety was the determining factor in identifying one of the four temporary truck routes as the preferred truck route. This route will be required to be used during times of day that children are waiting for or being dropped off from school buses and during peak travel times. The primary route (Route C), which uses River Road, North Street, Greenwood Road, and Chandler Road, was selected because it is wider with wider shoulders and has better sight distances than the other three routes (see Figure 4-1 from ENF in Attachment A). As required by the ENF Certificate, the use of Routes A, B, and D will be limited to the hours of 9:00am to 3:00pm. The requirement to use the primary route during certain times of the day for reasons of public safety are being incorporated into Specification Section 01170 (Special Provisions), which will be made part of the construction contract such that the construction contractor will be required to abide by them. Additionally, the construction contractor will be required to abide by the following requirements identified in the ENF which will be incorporated into Specification Section 01170:

- Proper signage of designated truck routes and monitoring to ensure trucks use of the designated routes.
- All soil/material deliveries will enter/exit via the landfill access point on Chandler Road (safer access).
- The Ledge Road entrance off Greenwood Road will be closed throughout construction.
- The new maintenance road to be constructed off Greenwood Road (to the south) can only be used throughout construction for parking and equipment drop-off; the construction contractor will be required to clean up "lines of sight" for drivers on Greenwood Road, by clearing some surrounding vegetation.

Post-Closure Use – Compliance with Massachusetts Stormwater Standards

Stormwater Standard No. 5 – Land Use with Higher Potential Pollutant Load

CDM Smith's previously stated position that the proposed post-closure use is not a Land Use with Higher Potential Pollutant Load (LUHPPL) subject to Stormwater Standard No. 5 has been accepted by the Andover Conservation Commission and the Commission's peer reviewer, as well as MassDEP Wetlands, as documented in the Order of Conditions and Superseding Order of Conditions for the project. Even so, with design changes implemented to respond to peer review comments, the proposed stormwater management facilities at the Ledge Road Landfill will fully comply with the requirements of Stormwater Standard No. 5 as well as the LUPPL requirements of Stormwater Standard 6. All the below requirements for LUHPPLs are met by the stormwater management facilities for the project:

- The water quality volume to be equal to one inch times the total impervious area of the post-development site. This requirement is met in each detention basin by setting the invert of the T-weir in the outlet control structure to provide the water quality volume below the invert, where it will either infiltrate (north detention basin) or drain through the underdrain system beneath the detention basin (south detention basin).

- At least 44% TSS removal prior to discharge to an infiltration device. This requirement is met by providing inline separators prior to discharge to both stormwater basins.

- Best Management Practices (BMPs) capable of providing the necessary water quality treatment.

Standard No. 9 – Operation and Maintenance Plan

Comments request additional details regarding the post-closure use DPW materials handling area operations and maintenance plan. The final Stormwater Report for the project, provided as Appendix M to the CAD Report, includes an Operation and Maintenance Plan and Long-Term Pollution Prevention Plan for the proposed stormwater facilities. Additional detail related to operation of the DPW materials handling area will be provided in an Operations Plan to be submitted with the Certification Report to be filed with MassDEP following completion of the project to document that the project was constructed in accordance with the design and regulatory approvals. As stated in the Corrective Action Design (CAD) Report, it is intended that the Operations Plan be in effect (i.e., approved by MassDEP) prior to startup of the DPW materials handling area. Responses to specific questions related to post-closure use operations are provided below:

What happens to materials stored at landfill now and related operations? How is the environment & drinking water protected? – Recycled asphalt, brick, and concrete (ABC) currently stored at the existing DPW materials handling area will be removed by the Town prior to the start of closure construction. Catch basin cleanings and street sweeping stored at the site will be used as shaping and grading material beneath the cap. Other soil materials from prior town construction projects currently stored at the existing DPW materials handling area are in the process of being characterized to ensure soils meet respective standards. Soils will then be used either above or below the cap based on the results of characterization. The environment will be protected as only clean soil materials, i.e., soil with concentrations below Massachusetts Contingency Plan (MC) Reportable Concentrations for Reporting Category RCS-1, will be used above the cap. All other materials will be removed from the site or used beneath the cap.

What is the standard (levels) and sampling plan to be used to determine if materials are OK for use for shaping and grading? Where will these results be submitted and who will approve? How will public see them? – MassDEP COMM-97-001 is the standard used to determine the acceptability of shaping and grading materials for use beneath a cap at unlined landfills. MCP Reportable Concentrations for Reporting Category RCS-1 are the standards used for determining acceptability of materials for use as common fill. For soil materials currently located at the site, the results of the characterization program will be submitted to MassDEP for approval and will be placed in the information repositories for the project. For imported borrow materials, following standard practice for landfill closure projects in Massachusetts, the specifications included in the CAD Report require the construction contractor to test each borrow source to confirm suitability and to provide the results to the certifying engineer for approval prior to bringing the soil on site. The test results will be provided in the Certification Report to be filed with MassDEP. The Certification Report will be placed in the information repositories for the project.

Why are no covers proposed over the storage bins to minimize stormwater contact & associated runoff with the materials? – The Operations Plan will detail the materials to be stored in each of the proposed storage bins. Once it is determined where specific materials will be stored, the Town will determine which bins will need to be covered and include this in the Operations Plan. Materials requiring cover will be determined consistent with applicable regulations and guidance. The Operations Plan will be subject to MassDEP approval.

Where is the evaluation or documentation that this alternative [the crushed stone laydown area] will not adversely affect the operation of the downstream inline separators? Would seem necessary given increase in percentage of fines to overall sediment loading? –See below "Crushed Stone Surfacing Bid Alternate".

Effects of DPW Material Handling Area Operations on Flexible Membrane Liner

This comment was previously addressed in CDM Smith's response to MassDEP's Notice of Technical Deficiency. Included with the response letter dated March 16, 2018 is a geotechnical evaluation that determined that stresses on the liner from DPW materials handling area operations will be acceptable. The evaluation looked at the stresses induced by large temporary stockpiles of material, which weigh considerably more than any equipment that would be used at the material handling area.

Crushed Stone Surfacing Bid Alternate

Comments expressed concern that the bid alternate (crushed stone in lieu of bituminous concrete pavement in a portion of the DPW materials handling area) was not adequately evaluated. The stormwater design was based on the base design, which includes paving the entire DPW material handling area. The bid alternate uses the same BMPs as the base design. The gravel infiltration trenches are conveyance structures that serve the same purpose as the catch basins and stormwater piping in the base alternative. The infiltration trenches discharge to the inline separators, which provide 44% pretreatment prior to discharging to the infiltration BMPs (i.e., the north and south stormwater basins).

As required by the Massachusetts Stormwater Standards, stormwater BMPs were designed to treat a volume of runoff equal to one inch times the total impervious area. If the bid alternate is implemented, thereby reducing the volume that the BMPs are required to treat, the proposed BMPs will be overdesigned. Therefore, the BMPs as designed are more than adequate for the bid alternate.

Comments also expressed concern about the potential for untreated stormwater to bypass the BMPs. This concern was address in CDM Smith's response to Notice of Technical Deficiency dated March 16, 2018. The bid alternate design was revised to include a flexible membrane liner on the outside and bottom of the gravel infiltration trench to prevent water in the trench from discharging to the sand drainage layer outside the DPW Area. The detail was also revised to show the collector pipe at the bottom of the trench to allow water in the trench to discharge to the manhole structure and not pond in the trench.

Other Potential Post Closure Uses

Comments express concern that other potential post-closure uses were not included in the post-closure use application or MassDEP Provisional Decision. As stated in the permit application, any post-closure uses other than the proposed DPW materials handling area (i.e., walking trails, solar panels) will require a separate post-closure use application for MassDEP review and approval. At this time, the Town is only requesting approval for the DPW material handling area.

Approval of Bid Alternate by Order of Conditions and Superseding Order of Conditions

Although Drawing C-A showing the crushed stone surfacing bid alternate was not included in the original Notice of Intent (NOI), Section 4.1.1.2 of the Project Narrative included with the NOI clearly indicated that the finished surface of the DPW Material Handling Area could be bituminous concrete pavement or gravel and Figure 1-2 showed the portion of the DPW materials handling area that could be gravel. Subsequent submittals to the Andover Conservation Commission included Drawing C-A, and the full set of project plans was provided to the Commission prior to issuance of the Order of Conditions. Following issuance of the Order of Conditions, a revised Sheet C-A (Revision No. 2 dated June 27, 2017) was submitted to the Conservation Commission on November 20, 2018. The revised Sheet C-A was approved by the Conservation Commission as an Insignificant Change at their December 15, 2017 meeting (see Attachment C). In support of the Superseding Order of Conditions (SOC) MassDEP wetlands was provided the June 27, 2017 revision of Drawing C-A via letter dated August 1, 2017. Therefore, the bid alternate was approved by both the Conservation Commission and MassDEP Wetlands.

We appreciate the opportunity to respond to comments received from the public on the Provisional Decision. As always, we remain available to answer any questions or provide additional information. Please do not hesitate to call me at (617) 452-6563 or Andy Miller at (617) 452-6532.

Very truly yours,

Nathan E. Jones, P.E.
Senior Environmental Engineer
CDM Smith Inc.

Andrew B. Miller, P.E., BCEE
Senior Project Manager
CDM Smith Inc.

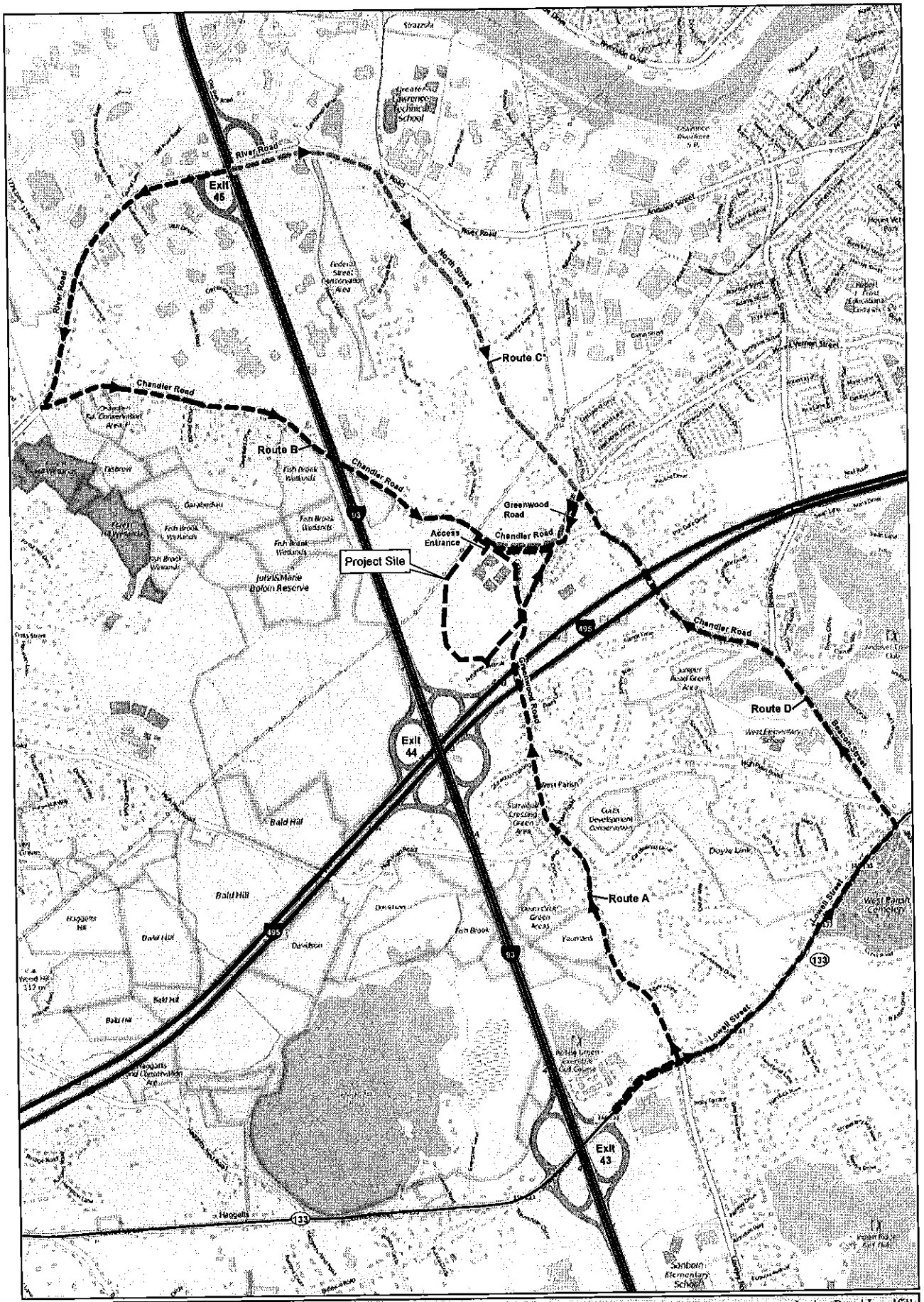
c: Christopher Cronin, Andover Director of Municipal Services (copy and electronic)
Marc Fournier, Andover Deputy Director of Public Works and Landfill Project Manager (electronic)
Richard Spieler, MassDEP-NERO (electronic)
Roger Moeller, MassDEP-NERO (electronic)
Information Repository (2 copies c/o Marc Fournier)

List of Attachments
- ENF Figure 4-1 – Truck Routes
- ENF Certificate
- Andover Conservation Commission approval of Insignificant Change

ATTACHMENT A

Figure 4-1 – Truck Routes

From Environmental Notification Form (ENF) filed August 2016



Ledge Road Landfill
Andover, Massachusetts
Figure 4-1: Truck Route Alternative Review and Recommendation

CDM Smith

ATTACHMENT B

Environmental Notification Form (ENF) Certificate (November 4, 2016)

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Charles D. Baker
GOVERNOR

Karyn E. Polito
LIEUTENANT GOVERNOR

Matthew A. Beaton
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1181
http://www.mass.gov/envir

November 4, 2016

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
ENVIRONMENTAL NOTIFICATION FORM

PROJECT NAME	: Ledge Road Landfill Closure Project
PROJECT MUNICIPALITY	: Andover
PROJECT WATERSHED	: Merrimack River
EEA NUMBER	: 15570
PROJECT PROPONENT	: Town of Andover, Department of Municipal Services Public Works
DATE NOTICED IN MONITOR	: September 7, 2016

Pursuant to the Massachusetts Environmental Policy Act (M.G. L. c. 30, ss. 61-62I) and Section 11.06 of the MEPA regulations (301 CMR 11.00), I hereby determine that this project **does not require** an Environmental Impact Report (EIR).

The information provided in the Environmental Notification Form (ENF) is sufficient for the purpose of MEPA review. The project consists of a remediation project designed to reduce potential hazardous conditions to human health and the environment associated with contamination from a landfill. As this landfill is located in an area important to the protection of a municipal drinking water supply, these remediation efforts are imperative. I note comments received from residents expressing concerns related to the remediation process and associated impacts to wetland resource areas impacts and the proposed Department of Public Works (DPW) materials handling facility. These comments range in focus from the design of the landfill cap, stormwater management systems, and wetland restoration efforts, to the operations of the DPW facility. The Massachusetts Department of Environmental Protection (MassDEP) Corrective Action Design (CAD) review process will include an opportunity for additional public review and comment for a period of at least 21 days, prior to issuance

of a final permit decision. Furthermore, the Town of Andover (the Town) will be required to place the CAD in the Public Involvement Plan (PIP) repository and hold a public meeting pursuant to the PIP plan. Furthermore, additional review of potential wetlands impacts and stormwater management measures will be conducted by the Conservation Commission review of the NOI and MassDEP review of the Section 401 Water Quality Certification (WQC). These are appropriate venues to deal with the site-plan level review necessary to ensure compliance with the Wetlands Protection Act and Clean Water Act.

Project Description

As described in the ENF, the project consists of implementation of a Corrective Action Alternative (CAA) to cap and close the 26-acre former Ledge Road Landfill. The ENF identifies post-closure uses which consist of construction of a DPW Materials Handling Facility and a solar photovoltaic (PV) array.

The CAA includes the following elements:

- Landfill Cap – installation of a solid waste cap consisting of a synthetic impermeable liner, a passive landfill gas control system, and a new stormwater management system consistent with Best Management Practices (BMPs).

- Impacted Wetland Soil Removal – removal of approximately 0.85 to 0.95 acres of arsenic-impacted soils from downgradient Bordering Vegetated Wetlands (BVW) to meet Massachusetts Contingency Plan (MCP) requirements. To achieve a Condition of No Significant Risk to human health, arsenic-impacted soils in excess of 900 milligrams per kilogram (mg/kg) will be excavated and disposed of within the capped landfill.

- Institutional and Engineering Controls – execution of post-construction deed notices for properties where landfilled waste will remain to meet the "Notice of Landfill Operations" requirements (310 CMR 19.141). The Town will also evaluate the need for additional deed notices and/or MCP Activity and Use Limitations (AULs) on parcels subject to the CAA. Engineering controls (e.g., fencing, gates, signage) will also be considered to limit site access.

- Post-Closure Monitoring and Inspection – Conduct a post-closure maintenance and monitoring program for 30 years (per 310 CMR 19.000) that will include monitoring of groundwater, surface water, landfill gas, and wetland soils.

The 6-acre DPW Materials Handling Facility will replace the informal facility currently operating on the uncapped landfill. A new perimeter access road will be constructed via a connection to Chandler Road. A bin system will be erected to provide temporary storage of: 1) excess materials from DPW Plant and Facilities operations requiring consolidation prior to re-use or off-site disposal (e.g., street sweepings; catch basin cleanings; asphalt, brick and concrete materials); 2) various construction materials for DPW and Plant and Facilities construction and maintenance operations (e.g., finished loam, gravel, clay, stone, mulch, etc.); and 3) storage of seasonal equipment and supplies

(e.g., traffic barrels, plows, storage containers). The facility will also provide space for use as staging areas (i.e., laydown for Town projects and storm debris).

Approximately 5.5-acres of the capped landfill will be graded to maximize the potential area available for installation of a solar PV array. These panels will be affixed to non-penetrating ground mounted concrete ballasts placed atop either crushed stone or grass. Overland electrical wiring and an inverter for connection to the power grid will also be installed upon final design of the PV array. The ENF estimated that a PV array could generate between 1.7 and 2.6 megawatt-hours (MW-hrs) of electricity per year.

In addition, the ENF indicated that the Town may pursue installation of a multi-use trail around the landfill for public use. The ENF did not identify the exact location, width and surface material of this trail system, or its potential intersection with the completion of the CAA, Because environmental impacts could not be assessed based on the conceptual information provided in the ENF, additional MEPA review will be likely be required if the Town decides to pursue this post-closure use. The Town should consult with the MEPA office prior to designing and implementing this project component to determine whether additional MEPA review would be warranted.

Project Site

The project site is located northeast of the intersection of Interstate 93 and Interstate 495, bounded to the immediate south by residential uses on Pettingill Road, to the east by residential uses on Greenwood and Ledge Roads, and to the north by residential uses on Chandler Road. The area to the west of the landfill is predominately vegetated open space and wooded wetlands. The site currently contains Town baseball and soccer fields, as well as a DPW materials handling facility constructed atop the northern portion of the site on fill material acquired as part of a 1980s-era building construction project at Raytheon's facility in Andover. The recreational fields, parking area and appurtenances (lighting, concession stand, etc.) will be eliminated from the landfill.

The landfill commenced operation shortly after World War II and was used for disposal of residential, commercial, industrial, and construction demolition wastes. In 1972, the Town was cited for violations of solid waste regulations as leachate emanating from the landfill was contaminating a tributary to Fish Brook. Fish Brook is located in a watershed that is a contributing source to Andover's water supply. An Order issued by the Department of Public Health (DPH) in 1972 instructed the Town to construct an underdrain system to capture and re-route upgradient groundwater flow into the landfill to limit the generation of leachate to downgradient wetlands. These underdrains are in poor condition with exposed and broken pipes and collapsed manholes. The DPH Order also directed the Town to begin preparing to close the landfill. The landfill ceased operations shortly thereafter. According to the ENF, the Town has been working with MassDEP since 1995 to advance the landfill closure process.

The project area is regulated under the Massachusetts Contingency Plan (MCP) – Release Tracking Number (RTN) 3-27632 as a Solid Waste Management Facility. In 2008, an Immediate Response Action (IRA) plan was implemented on the site due to the elevated arsenic levels in the downgradient wetlands. According to the ENF, the elevated arsenic concentrations in sediment appear to be a result of reducing conditions in groundwater from the landfill, with elevated soluble concentrations of naturally-occurring arsenic discharging to the downgradient wetland. The arsenic then

oxidizes and co-precipitates with iron, creating iron arsenate precipitate. Elevated concentrations of iron, significant iron staining, and suspended iron floc are also present in downgradient wetlands. Signs are posted at access points to contaminated wetlands to indicate areas where the wetlands are contaminated and alert trespassers to potential risks.

Proposed soil remediation is located in Outstanding Resource Waters (ORWs) associated with Fish Brook and its BVW. The project site is not located within a designated Area of Critical Environmental Concern (ACEC), is not identified as Estimated or Priority Habitat for State-listed rare species by the Natural Heritage and Endangered Species Program (NHESP), and does not contain identified historical or archaeological resources. The project site is not located within the 100-year floodplain as mapped by the Federal Emergency Management Agency (FEMA).

Environmental Impacts and Mitigation

Potential environmental impacts include alteration of numerous wetland resource areas including: 1,500 linear feet (lf) of Bank, approximately 37,026 sf of BVW, and 23,200 sf of Isolated Land Subject to Flooding (ILSF). The DPW materials handling facility and access road will create an additional 5.95 acres of impervious area on-site.[1] Traffic trips associated with the DPW facility are expected to remain at current levels which vary between zero and 20 average daily trips (adt), but may increase up to 40 adt during paving season. Construction period traffic trips during the landfill capping are projected at approximately 40 adt over a 10-hour period. Environmental impacts associated with existing uses will be eliminated (i.e., recreational fields parking area (38,768 sf), traffic trips (approximately 40 trips, but varies based on field use), water use (2,000 gallons per day)).

Measures to avoid, minimize and mitigate environmental impacts include: implementation of the CAA; construction of a stormwater management system; construction period erosion, sediment, noise and air quality control measures; construction of wetland replication areas; and implementation of post-closure maintenance, care and environmental monitoring program at the site, pursuant to 310 CMR 19.140.

Jurisdiction and Permitting

The project is undergoing MEPA review pursuant to 301 CMR 11.03(3)(b)(1)(d) because it requires State Agency Actions and will result in the alteration of 5,000 or more square feet of Bordering or Isolated Vegetated Wetlands. The project will require a Section 401 Water Quality Certification (401 WQC), Corrective Action Design (CAD) Approval (BRP SW 25), a Landfill Post-Closure Use Permit (BRP SW 36), a Corrective Action Certification (BWP SW 43), and a Permit to Discharge to ORWs (BRP WM 09) from MassDEP. The project will require an Order of Conditions from the Andover Conservation Commission, or in the case of an appeal, a Superseding Order of Conditions from MassDEP.

The project is expected to qualify for a Pre-Construction Notification (PCN) under General Permit 17 – Cleanup of Hazardous and Toxic Waste from the U.S. Army Corps of Engineers (ACOE).

[1] The ENF assumed that the entire DPW materials handling facility will be paved to represent a "worst-case scenario", however, portions of the facility may be gravel. The 1.0 acre parking lot will be removed, resulting in a net increase of 4.95 acres of impervious area.

The project will require a National Pollutant Discharge Elimination System (NPDES) Construction General Permit from the U.S. Environmental Protection Agency (EPA).

Because the project does not include State Financial Assistance, MEPA jurisdiction extends to those aspects of the project that are within the subject matter of required or potentially required state Permits and that may cause Damage to the Environment, as defined in the MEPA regulations.[2] In this case, MEPA jurisdiction extends to land alteration, wetlands, and solid and hazardous waste.

Review of the ENF

The ENF described existing and proposed conditions (including groundwater, surface water and sediment quality), identified potential environmental impacts of the CAA and post-closure uses, and project mitigation measures. The Proponent provided additional information in response to questions raised at the September 21, 2016 site visit and comments received from MassDEP.[3] These materials included a stormwater management report for the landfill closure and post-closure uses and revisions to the ENF form regarding potential impacts to wetland resource areas. For the purposes of this Certificate, this supplemental information in combination with the original ENF is collectively referred to as the ENF. To allow sufficient time for review of these materials, the ENF comment period was extended to October 27, 2016.

The Town completed a Corrective Action Alternative Analysis (CAAA) consistent with the MassDEP Solid Waste Management Regulations. As noted in the ENF, the purpose of the CAAA is to identify and evaluate landfill closure alternatives to facilitate the selection of the most appropriate or feasible alternative for implementation. The CAAA process included the development and screening of numerous corrective action technologies to determine a Preferred Alternative that can effectively address issues related to landfill waste materials, landfill gas, landfill-impacted groundwater, and downgradient wetland sediment contamination. Technologies retained during the initial screening process were further evaluated to facilitate integration into "CAA packages" to address the four components of landfill closure: 1) landfill cap, 2) groundwater source control to mitigate discharge of arsenic impacted groundwater to downgradient wetlands, 3) removal of downgradient arsenic-impacted wetland soils, and 4) institutional and engineering controls. Six CAA packages were evaluated:

1. No Further Action Alternative
2. Groundwater pump and treat with standard HDPE cap and passive gas vent system, groundwater extraction wells, and conventional treatment (package aeration, flocculation, settling system);
3. Groundwater pump and treat with alternative soil cap, groundwater extraction wells, and conventional treatment (package aeration, flocculation, settling system);
4. Aeration pond/wetland treatment system with standard HDPE cap with passive gas vent system and groundwater collection trench;
5. Aeration pond/wetland treatment system with alternative soil cap and groundwater collection trench; and
6. Air sparge system with alternative soil cap.

[2] Comments received identify future Financial Assistance for the project from the MassDEP 2016 Clean Water State Revolving Fund (CWSRF). In a letter dated June 29, 2016 from the Town of Andover to MassDEP, the Town informed MassDEP that it would forgo borrowing under the CWSRF due to the Town's current favorable bond rate.

[3] Correspondence from CDM Smith dated September 30, 2016, October 17, 2016 and October 25, 2016.

This 2012 CAAA recommended a groundwater collection trench with a passive aeration pond/wetland treatment system coupled with an alternative soil cap atop the landfill, removal of arsenic-impacted soils, and associated institutional/engineering control. Subsequent to the completion of additional data gathering and analysis in support of the recommended CAA, this alternative was determined by the Town to be insufficient to meet project goals. The Town evaluated additional options, including use of a soil cap with active treatment systems. Ultimately, the Town determined that project goals can be met through the Preferred Alternative presented in the ENF. The impermeable solid waste cap is expected to lower the water table below the waste, thereby mitigating the continued accumulation of arsenic-impacted wetland soils downgradient of the landfill. The Town also determined that this alternative was a more cost-effective solution.

Post-closure use alternatives included the ongoing use or expansion of recreational fields, continuation of the DPW materials handling facility, open space, a recycling center and a solar array. The Town also considered using the site to accept contaminated soils that meet MassDEP's COMM-97-001 Policy for use as shaping and grading material. These alternatives were discussed in public forums as part of the MCP PIP process, workshops and Board of Selectmen meetings. The Town determined that the recreational fields were not necessary, as other Town land is available for these uses, that a recycling center was not necessary due to curb-side recycling services, and acceptance of contaminated soils would generate too much truck traffic in the neighborhood.

Three alternative layouts were considered for the preferred development program consisting of a DPW materials handling facility and a solar PV array. The primary focus of these layout alternatives was the access point. The Town considered access via the existing Ledge Road access, a new access road off of Greenwood Road, and access from Chandler Road. The Preferred Alternative includes an access from Chandler Road with improved lines-of-sight for drivers to improve safety compared to existing conditions. The Preferred Alternative will also include plantings to provide screening and improve aesthetics from Chandler Road, Greenwood Road, and the Pettingill Avenue areas.

Wetlands and Water Supply Resources

The Town prepared a conceptual hydrogeological model as part of the CAAA. As stated in the ENF, the model suggests that stormwater infiltration through the unlined landfill and the presence of the water table in the lower vertical limits of waste results in the generation of leachate and poor groundwater conditions beneath the landfill. These conditions mobilize the naturally-occurring arsenic and create elevated concentrations of arsenic in the groundwater, surface water and sediment downgradient of the landfill. The ENF also noted the presence of other common landfill contaminants such as 1,4 dioxane and secondary contaminants such as manganese, iron, chloride and sodium in downgradient groundwater and surface waters.

As described in the ENF, the project site contains tributaries and wetlands within the Fish Brook subwatershed. Fish Brook serves a small portion of the Town's drinking water supply via an impoundment at the Fish Brook outlet to the Merrimack River that holds water during certain parts of the year. A pumping station pumps water from the impoundment to Haggetts Pond via a 2.85-mile long transmission main. As a contributing source to the Town's water supply, Fish Brook is classified as a Class A Surface Water Source (314 CMR 4.05(3)(a)) and the headwater wetlands downgradient of the

landfill are designated as ORWs. Furthermore, groundwater on-site is classified as GW-1 (drinking water source area) because the site contains a Class A Surface Water and ORW. Data indicate that the furthest downgradient detection of arsenic greater than the Massachusetts Drinking Water Standards is approximately 750 feet southwest of the landfill. Data have also indicated that 1,4-dioxane is also present in groundwater downgradient of the landfill at concentrations exceeding Massachusetts Drinking Water Standards. Groundwater discharges result in the precipitation of iron and arsenic out of solution onto wetland sediments and into surface water. The highest concentrations of arsenic in surface water have been detected approximately 400-500 feet downgradient of the landfill. According to the ENF, data sampling indicate that arsenic contamination is not migrating into Fish Brook greater than the Massachusetts Drinking Water Standards. Levels of 1,4-dioxane in surface water exceed Massachusetts Drinking Water Standards at certain locations, but decrease in concentration with distance from the landfill.

Sediment data provided in the ENF confirm the presence of seven arsenic hot spot areas (exceed 900 mg/kg) within the downgradient wetland system that appear to coincide with groundwater arsenic plume data. These data indicate that arsenic concentrations greater than 900 mg/kg in sediment are limited to shallow surface intervals (0-2 inches), with concentrations gathered from 6-8 inches below the surface well below 900 mg/kg. The ENF noted that the areas between and adjacent to hot spots are comprised of low-lying swamps and intermittent streams that contain iron and arsenic floc, but at concentrations less than 900 mg/kg, likely due to their location within the footprint of groundwater with lower arsenic concentrations. The ENF stated that the data collected between 2005-2009 and 2015 suggest that the groundwater, hydrologic conditions, and geochemical processes have reached a steady state, meaning that current iron and arsenic floc areas with concentrations less than 900 mg/kg will remain at current levels into the future.

The project will require an Order of Conditions from the Andover Conservation Commission and an Individual 401 WQC from MassDEP due to the alteration of BVW and ILSF. The project site contains several wetland resource areas including Bank, BVW, and IVW. The ENF also identified several intermittent streams and potential vernal pools on, or adjacent to the project site. An Order of Resource Area Delineation (ORAD) was issued by the Andover Conservation Commission on December 7, 2015 (DEP File No. 090-1255) that approved delineated portions of the wetland resource areas that will be impacted by the project. Additional wetland delineations have been performed or are ongoing by the Town, but have not been subject to the ORAD process by the Andover Conservation Commission.

The project will impact wetland resource areas including 1,486 lf of temporary and 14 lf of permanent impact to Bank; 31,341 sf of temporary impact and 5,685 sf of permanent impact to BVW, and 23,200 sf of permanent impact to ILSF. Permanent impact to Bank is associated with the installation of a riprap apron at the flared end of a pipe discharging to a detention basin. Permanent impact to ILSF is associated with the capping of the landfill. Temporarily altered wetlands will be restored in-kind. Permanent wetland loss will be mitigated at a minimum 2:1 ratio, or to the extent practicable, subject to the approval of the ACOE, MassDEP and the Andover Conservation Commission. Replication is proposed on adjacent Town-owned parcels within the downgradient remediation area, but may also be proposed off-site to meet statutory requirements and limit the clearing of mature forest vegetation in upland areas. The areas of ILSF and IVW atop the landfill render it infeasible to excavate and remove

the waste at these locations. Therefore, the Town proposes to double-line these areas and restore them as wet meadows to provide flood storage capacity as part of the stormwater management system.

The ENF indicated that there are currently no certified vernal pools within the project site. However, investigations of five potential vernal pools (PVPs) within and near the project area concluded that all five PVPs meet the NHESP certification requirements for vernal pools. Three of these PVPs are located on a neighboring parcel owned by the Park Family Trust. Data gathered as part of the PVP investigation will be provided to the NHESP to certify all five PVPs. The Town will design the project in a manner that will maintain water flow to vernal pools. I expect the Town will directly address this issue as part of the Notice of Intent (NOI) process.

As noted previously, arsenic-impacted wetland soils will be excavated from BVW and intermittent streams and disposed of within the limits of the landfill prior to cap construction. Proposed soil excavation depths for arsenic remediation is approximately one foot. Heavy equipment will be used for excavation. Vacuum excavation will be used, if feasible, in the non-vegetated areas (i.e., intermittent streams and depressions) to minimize impacts to wetland resource areas. Excavation will be performed during periods of low flow and, if necessary, coffer dams will be installed within intermittent stream beds using sand bags to divert flows to a location downstream beyond the work area. While the Town intends to excavate soils when they are dry, this may not be possible. Therefore, if wetland soils are not sufficiently dry at the time of excavation, they will be loaded into vacuum excavators or lined trucks and transported to a designated drying area atop the landfill. This area will be lined with polyethylene sheeting and berms will be created to prevent runoff. Soils will be allowed to dry and/or be mixed with soil or other materials as appropriate to eliminate free liquids.

Access routes to the hot spot wetland removal areas will be identified prior to the start of the remediation effort and should focus on avoiding wetland resource areas to the extent practicable. Existing trails in upland areas will be used to the maximum extent practicable. Where these areas cannot be avoided, BMPs such as swamp mats should be used to limit impacts. Restoration of impacted areas will include replacement of excavated materials from streambeds with uncontaminated sandy gravel, restoration to pre-construction grades, and planting with native trees, shrubs and wetland seed mixture. I note MassDEP's comments regarding replication of the stream beds using uncontaminated materials such as naturally occurring large cobbles, boulders and or logs removed during the excavation process. The Town should consider MassDEP's comments during the final design of the wetland replication plans. All restoration should be completed in accordance with permit requirements to be set forth by the Andover Conservation Commission, the ACOE, and MassDEP.

The ENF noted that it is possible that additional soil removal areas may be identified during construction by additional laboratory analytical testing. As such, the ENF assumed an upper range of potential BVW impacts of no greater than 41,382 sf (0.95 acres). I note that these impacts approach the wetland impact thresholds for a mandatory Environmental Impact Report (EIR). The Town should continue to track any design changes as the project is implemented to ensure that overall wetland impacts remain below MEPA EIR thresholds. If subsequent design or analysis would result in more than one acre of BVW alteration the Proponent should consult with the MEPA office, as a Notice of Project Change (NPC) may be necessary.

Furthermore, I note concerns from residents regarding the operation of a DPW materials handling facility in an area adjacent to land with tributaries and wetlands that contribute to the Town's water supply. It is imperative that the Town carefully consider the proposed uses on-site, the components of the proposed stormwater management system and potential operational BMPs to ensure the protection of these water resources.

Stormwater

The ENF included a stormwater drainage report that characterized existing and proposed conditions, contained data supporting the drainage analysis, and a discussion of the project's compliance with MassDEP stormwater management standards (SMS). According to the ENF, the stormwater management system has been designed to capture and treat all stormwater runoff from the proposed DPW materials handling facility, the vegetated areas of the landfill, and the proposed solar PV array. To be conservative, the stormwater management analysis assumed that 25% of the solar area would be impervious to account for the high-end range of ballasted systems currently available. The drainage analysis evaluated peak rates of runoff and runoff volumes during a 2-, 10-, 25- and 100-year 24-hour storm event. The project will include BMPs to treat the first inch of runoff from all paved areas consistent with SMS requirements for discharges to ORWs. The Town will prepare a Stormwater Pollution Prevention Plan (SWPPP) consistent with the NPDES CGP and an Operation and Maintenance Plan for the stormwater management system.

Capping the landfill will eliminate infiltration of precipitation into the landfill. To mitigate stormwater flows, vegetated swales will be located along the western and eastern sides to the landfill to direct stormwater runoff to two detention basins, one located on the north, and the other located on the south side of the landfill. Stormwater runoff from the northeastern area of the landfill will sheet flow to a replicated wetland located on the eastern edge of the landfill cap. The northern detention basin will be located outside the edge of waste and therefore capable of providing groundwater recharge. This detention basin will be sized to provide recharge volumes for the entire paved area on the landfill consistent with the SMS. The southern basin will be located within the edge of waste and will not provide groundwater recharge due to the impermeable liner. A proprietary water quality separator device will be installed in the northern detention area embankment, just outside the edge of waste and a sediment forebay will be constructed in conjunction with the southern basin to provide additional water quality treatment. Gravel maintenance access roads will be provided to each of the two stormwater basins. The perimeter road for the DPW facility will be pitched away from the collection bins and a retaining wall will be installed along the western perimeter of the area to prevent stormwater from directly entering the wetland system. Stormwater runoff from paved areas within the DPW facility will be collected in catch basins and flow into three separate closed drainage systems prior to discharge to the two detention basins.

The Town should review MassDEP's comments regarding the applicability of redevelopment or new development SMS for specific portions of the project. The Town will be required to demonstrate consistency with applicable SMS during the NOI process. As noted in the ENF, the project will provide for peak rate attenuation of stormwater flows for each design storm with the exception of the 2-year, 24-hour storm flows to the southern discharge point. The Town should address this issue in its NOI application. The Town should demonstrate compliance with the Land Use with Higher Potential Pollutant Loads (LUHPPL) and provide additional information on measures to mitigate stormwater

runoff within the DPW facility as part of the NOI review. The drainage analysis should be based on a clear understanding of proposed uses at the DPW facility (i.e., vehicle cleaning, types of materials stored, snow storage, etc.).

Hazardous Waste

To define the limit of waste and assess the impact of the uncapped landfill on public health and the environment, the Town has completed the following investigations under the MassDEP Solid Waste Regulations: 1) an Initial Site Assessment (ISA); 2) a Comprehensive Site Assessment (CSA); and 3) the CAAA. As noted previously, these assessments were conducted to facilitate the selection of the CAA. The purpose of the CAA is to improve conditions on-site to meet a Condition of No Significant Risk, as defined in the MCP. It is anticipated that the CAA will result in a decline in concentration of leachate parameters, inclusive of 1,4-dioxane, within water resources (surface and groundwater) and wetlands immediately downgradient of the landfill. Following landfill cap installation and sediment removal, sampling of groundwater, surface water and sediment will continue in accordance with MassDEP Solid Waste Regulations. This sampling plan will be designed to monitor the effectiveness of the cap in lowering the water table below the waste in a manner consistent with the predicted modeling conclusions.

Article 97 Lands

The project site includes both the landfill and adjacent open space located to the west of the landfill and east of Interstate 93. The parcels west of the landfill were acquired from the Town in 2013 from the Andover Village Improvements Society (AVIS) to facilitate implementation of the CAAA. Neither the landfill, nor that former AVIS property are designated as land held for natural resources purposes in accordance with Article 97 of the Amendments to the Constitution of the Commonwealth (Article 97). However, an approximately 0.72-acre property (the McGrath Parcel) that was acquired in 2003 by the Andover Conservation Commission in accordance with M.G.L. Chapter 40, Section 8C for the "promotion and development of the natural resources and for the protection of the watershed resources of the Town of Andover..." is designated as Article 97 land. This parcel is located downgradient of the landfill and was the site of a former residence that burnt down. The property is now an open meadow with a sparse tree canopy. The property includes a 600-foot long paved driveway which will be used as a construction equipment access point (via Pettingill Road) and staging area. Subsequent to use as a staging area, the paved driveway will be removed and the upland areas of the site will be transformed into wetland replication areas as mitigation for unavoidable wetland impacts associated with arsenic removal. The Andover Conservation Commission will retain ownership of the property in the post-remediation/wetland replication condition. Subject to the approval of the Andover Conservation Commission in accordance with the Wetlands Protection Act and local wetlands bylaw, the proposed work appears consistent with the deed restrictions associated with the parcel and Article 97. As no net loss of Article 97 lands will occur, no additional mitigation is required in the form of land acquisition per EEA's Article 97 Policy.

Air Quality

The Town currently conducts landfill gas monitoring on a quarterly basis as required by MassDEP. This monitoring program includes data collection and monitoring of methane, ambient

volatile organic compounds (VOCs), and ambient fixed gas. Landfill gas is present along the landfill property line to the north of the recreational fields' parking lot but is not migrating under Chandler Road or beyond the landfill property boundary. Modeling of the landfill using the EPA's Landfill Gas Emission Model (LandGEM) concluded that landfill gas generation is relatively low given the landfill's age and that emission rates will decrease over time. To prevent off-site gas migration in excess of 25% of the lower explosive limit (LEL) at the property boundary (consistent with MassDEP regulations), a system of passive landfill gas vents will be installed across the capped landfill and a passive gas trench will be installed near Chandler Road. Permanent landfill gas monitoring wells will also be installed between the landfilled edge of waste and nearby property boundaries and/or utilities. A landfill gas capture system for use as a renewable energy source was deemed infeasible as the amount of available methane is too small to render such a facility economically feasible. I note requests from commenters that the Town, and DPW trucks and facilities in particular, consider diesel mitigation measures as part of their daily operations. I strongly encourage the Town to focus on limiting diesel emissions either through use of updated equipment or operational BMPs.

Construction

The Town intends to award the project contract in September 2017, with an anticipated project completion date of May 2019 (assuming an 18-month construction duration with two winter shutdowns from late December to mid-March). The project is proposed to proceed as a single construction contract inclusive of landfill capping, arsenic remediation and reconstruction of the DPW materials handling facility. The ENF indicated that the construction process for capping the landfill will generate approximately 40 truck trips per day over a 10-hour period during an 18-month construction window. Trucks are expected to travel from Interstate 93 to access the project site. The ENF evaluated four potential construction period truck access routes. The recommended route (Route C) consists of trucks exiting Interstate 93 at Exit 45-River Road, following River Road northbound to North Street, wherein trucks will take a right at this signalized intersection and head south on North Street to its intersection with Greenwood Road. Trucks will follow Greenwood Road and turn right onto Chandler Road prior to entering the construction entrance to the site. Other routes may be used as alternatives with time of day restrictions (i.e., 9:00 am to 3:00 pm). I anticipate that the Town will be provide more detail regarding truck access routes, time of operations, and other construction period conditions to limit impacts to the environment and surrounding land uses as part of both the local review and MassDEP permitting processes.

The Proponent should implement and maintain erosion and sedimentation control measures, as appropriate. All activities should be managed in accordance with applicable MassDEP Solid Waste and Air Pollution Control regulations pursuant to M.G.L. c.40, §54. I strongly encourage the Proponent to require contractors to use construction equipment with engines manufactured to Tier 4 federal emissions standards or retrofitted with the best available after-engine emission control technology, such as oxidation catalysts or diesel particulate filters. The Proponent will implement a program to minimize excessive idling during the construction period.

Conclusion

As noted previously, MassDEP will further assess the project's consistency with Solid Waste Regulations and the Clean Water Act and additional opportunities for public comment will be provided. Any post-closure use(s) of the landfill not reviewed and permitted as part of the closure design, such as the multi-use trail that has been considered but has not been designed, will require submittal of an application to MassDEP in accordance with Solid Waste Regulations.

The ENF has sufficiently defined the nature and general elements of the project for the purpose of MEPA review and demonstrated that the project's environmental impacts will be avoided, minimized and/or mitigated to the extent practicable. Based on review of the ENF and comments received, and in consultation with State Agencies, I have determined that no further MEPA review is required.

November 4, 2016
Date

Matthew A. Beaton

Comments Received:

9/20/2016	Keith Saxon (3 letters)
10/10/2016	Brad Wright
10/11/2016	Massachusetts Department of Environmental Protection – Northeast Regional Office (MassDEP- NERO)
10/11/2016	Keith Saxon
10/27/2016	Joe Albuquerque
10/27/2016	Keith Saxon (3 letters)

MAB/HSJ/hsj

ATTACHMENT C

Andover Conservation Commission

Approval of Insignificant Change (December 6, 2017)

TOWN OF ANDOVER

Conservation Department
Town Offices
36 Bartlet Street
Andover, MA 01810
(978) 623-8311
www.andoverma.gov

December 6, 2017

Magdalena Lofstedt, PWS
CDM Smith, Inc.
75 State Street, Suite 701
Boston, Massachusetts 02109

Re: **Insignificant Change Request**
10 Ledge Road, Andover
DEP File No. 090-1281

Dear Ms. Lofstedt:

Please be advised that the Andover Conservation Commission at their December 5, 2017 meeting approved the plan revisions outlined in your letters dated November 20, 2017 as an Insignificant Change and plan "Town of Andover, Massachusetts Ledge Road Landfill Closure Project, Bid Alternate Plan and Detail", dated June 20, 2017 100% Corrective Action Design Submittal-Not For Construction.

The revisions included:

1. Revisions to the stormwater design, including forebay for the North Basin and in –line proprietary separator device upstream of the South Basin

Please be advised that the Andover Conservation Commission at their December 5, 2017 meeting approved the plan revisions outlined in your letters dated November 21, 2017 as an Insignificant Change and plan "Town of Andover, Massachusetts Ledge Road Landfill Closure Project, Wetland Soils Remediation Plan (Sheet 2 of 3) and Wetland Replication Plan and Section", dated November, 2017 100% Corrective Action Design Submittal-Not For Construction.

The revisions included:

1. Elimination of access road extending across the wetland replication area; this will increase the wetland replication area planned on the former McGrath Property by approximately 1,900 square feet;
2. Removal of the culvert immediately south of the replication area and restoration of stream channel and bank per Detail 6 on Sheet ES-2; and
3. Removal of culvert just beyond the former McGrath Property and restoration of stream channel and bank per Detail 6 on Sheet ES-2.

For the Andover Conservation Commission,

Lynn M. Viselli,
Conservation Administrative Secretary
CC: DEP, Chris Cronin and Marc Fournier

CDM Smith

75 State Street, Suite 701
Boston, Massachusetts 02109
tel: 617 452-6000
fax: 617 345-3901

November 20, 2017

Mr. Robert Douglas, Director of Conservation
Conservation Division – Town of Andover
Town Offices
36 Bartlet Street
Andover, Massachusetts 01810

Subject: Insignificant Administrative Change – Sheet C-A Bid Alternate DPW Materials Handling Area
Order of Conditions/ DEP Wetlands File #90-1281
10 Ledge Road, Ledge Road Landfill
Town of Andover, Massachusetts

Dear Mr. Douglas:

On behalf of the Town of Andover Municipal Services – Public Works, CDM Smith Inc. (CDM Smith) is requesting an Insignificant Administrative Change for inadvertently including an incorrect version of Sheet C-A in the Final Design Plans dated April 26, 2017 and cited in the approved OOC (DEP File No. #90-1281). This request replaces the previous letter submitted by CDM Smith to the Andover Conservation Commission (ACC) dated August 2, 2017, which was never acted upon by the ACC.

Sheet C-A shows the Bid Alternate for the landfill cap in the DPW materials handling area. The incorrect version of Sheet C-A did not include revisions to the stormwater design (forebay for the North Basin and in-line proprietary separator device upstream of the South Basin), which were reviewed and agreed to by Dan MacRitchie and the ACC during the Peer Review of the Notice of Intent (NOI) process.

Please find enclosed Sheet C-A (Revision No. 2 dated June 27, 2017), which shows the above listed revisions. The dense-graded crushed stone will provide a potential cost savings to the Town. The intent is to bid both options (pavement vs. crushed stone) and then select the preferred alternative based on cost and available funding. The stormwater design is the same for each option, except that the catch basins and associated piping in those portions of the DPW materials handling area to receive dense-graded crushed stone surfacing will be replaced with a gravel infiltration trench as shown on Detail 1 on Sheet C-A. Please note that the stormwater design computations were based

on impervious pavement, which is the more conservative approach; therefore, the stormwater design will be more than adequate in the case that crushed stone is selected.

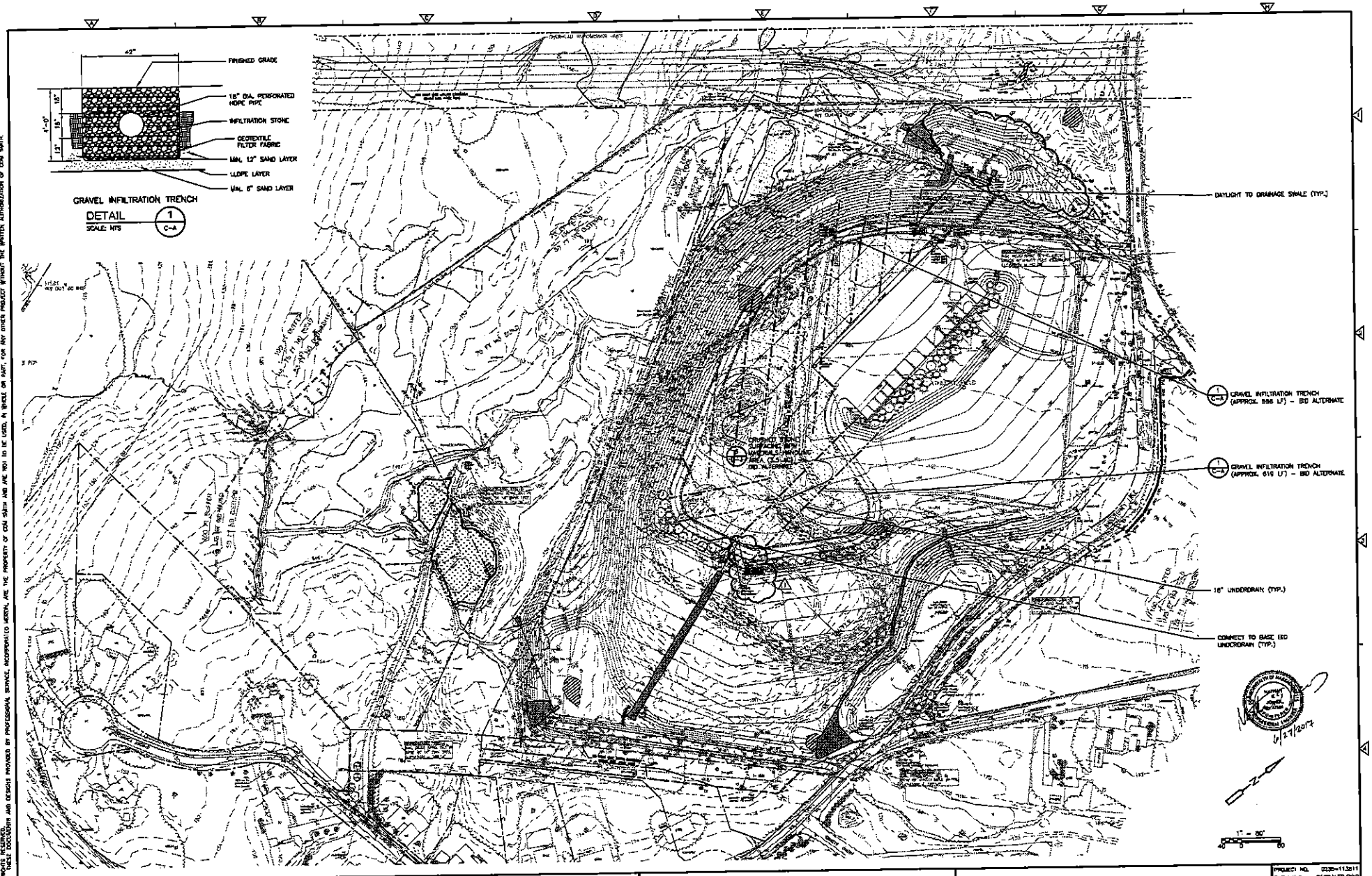
You may contact me at (617) 452-6597 or Andrew Miller, Project Manager, at (617) 452-6532 with any questions or comments about this project.

Sincerely,

Magdalena Lofstedt, PWS
Environmental Scientist
CDM Smith Inc.

Enclosure

c: Marc Fournier, Deputy Director of Public Works/Project Manager Landfill Closure, Andover, MA
Chris Cronin, Director, Department of Municipal Services, Andover, MA
Andrew Miller, CDM Smith Inc.
Nathan Jones, CDM Smith Inc.
Information Repository (2 copies c/o M. Fournier and eRoom)



REV. NO.	DATE	DRWN	CHKD	REMARKS
2	6/2017	JMH	MCJ	UPDATED TO INCLUDE STORMWATER REVISIONS
1	1/2017	JMH	MCJ	REVISED TO RESPOND TO CONSERVATION COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY: S. HOWARD
DRAWN BY: J. HILL
SHEET CHK'D BY: C. CARO
CHKD CHK'D BY: R. JONES
APPROVED BY: D. CUNNINGHAM
DATE: MARCH 2017

CDM Smith
75 State Street, Suite 701
Boston, MA 02109
Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

BID ALTERNATE - PLAN AND DETAIL

PROJECT NO. 3230-113811
FILE NAME: C100ALTP.DWG
SHEET NO. C-A

100% CORRECTIVE ACTION DESIGN SUBMITTAL - NOT FOR CONSTRUCTION

WRITTEN Standard Survey Dwg - MSP 9.2.15, Final_Grading_Spring_CDMS_2013A, Full Site Survey Marked 8.11.16, C0010PPL, 16.533-03-16] [output 0]
Last saved by JOHENE Thursday, 6/22/2017 11:42:02 PM
P:\PL\DACP\3230\PL_PL\3230113811\03 Design Services\NL_1005\02 CIVIL\01 CADD\VERSION 11\C100ALTP.dwg
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NOTICE OF COPYRIGHT: THESE DRAWINGS AND DESIGNS PROVIDED BY PROFESSIONAL SERVICE, INCORPORATED HEREIN, ARE THE PROPERTY OF CDM SMITH AND ARE NOT TO BE USED, IN WHOLE OR PART, FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF CDM SMITH.

ATTACHMENT 3

Response to Comments
Transmittal Number: X275420

May 3, 2019

This Response to Comments (RTC) document concerns comments received by the Massachusetts Department of Environmental Protection (MassDEP) about a proposal made by the Town of Andover (the Town) relating to the closure and post-closure use of the Ledge Road Landfill located in Andover, Massachusetts (the Landfill).

The RTC is organized as follows:

I. INTRODUCTION AND BACKGROUND
   A. Public Participation and Procedural History
   B. Change Made to Decision as Result of Public Comment
II. MassDEP RESPONSE TO COMMENTS ON THE PROVISIONAL DECISION
III. CONCLUSION

I. INTRODUCTION AND BACKGROUND

A. Provisional Decision and Public Participation

On April 30, 2018, MassDEP issued a Provisional Decision for Public Comment regarding the Town's application for approval of the proposed design for closure of the Landfill (the Corrective Action Design or CAD) and the post-closure use of a portion of the Landfill for a Department of Public Works (DPW) material storage yard (Landfill Closure and DPW Yard). The application package was submitted with separate transmittal forms for the proposed Landfill final cover design and the proposed post-closure use (permit category BWP SW25 *Corrective Action Design*, Transmittal Number: X275420, and permit category BWP SW36 *Post-Closure Use—Major*, Transmittal Number: X275730, respectiviely; together, the Application). Given the scope of the proposed activities, MassDEP reviewed the Application as category BWP SW25 *Corrective Action Design*.

In 2005, The Town received a petition from Andover residents requesting that the Landfill be designated as a Public Involvement Plan (PIP) site pursuant to MGL c21E 14(a). The Landfill was designated as a PIP site on September 27, 2005. The PIP process requires that key documents be made available for public review and comment. Therefore, MassDEP issued a Provisional Decision on the Application to allow interested parties the opportunity to review and comment on the Provisional Decision. The Public Comment Period on the Provisional Decision closed at 5:00 p.m. on May 30, 2018.

MassDEP received six written comment submissions, including comments from Town residents and Town officials (collectively, the Public Comments). Also, on behalf of the Town, CDM Smith, Inc. prepared and submitted to MassDEP a response to the Public Comments received during the comment period dated November 15, 2018. Copies of the Public Comments received by MassDEP and the Town's response to Public Comments are attached to MassDEP's Final Decision as Attachment 2.

B. Change Made to Decision as a Result of Public Comment

MassDEP is including a condition in its Final Decision that requires the Town to submit, within ninety (90) days of the effective date of the Final Decision, an update to its Operation and Maintenance Plan to include the DPW materials handling area and a Storm Water Pollution Prevention Plan (SWPPP) for the site that includes, without limitations, procedures for the control and prevention of spills at the DPW Yard area.

II. MassDEP RESPONSE TO SIGNIFICANT COMMENTS ON THE PROVISIONAL DECISION

MassDEP has considered each comment in its entirety. MassDEP has generally grouped related comments together for response below. No significance should be attached to the format in which MassDEP chose to cite or summarize the original comment or the order in which responses in this RTC are provided.

Comment 1:
One commenter expressed concern about management of landfill gas vented from the southern passive vent trench and specifically the potential for vented landfill gas to cause nuisance odors and public health issues.

MassDEP Response:
MassDEP has considered the potential odor and public health issues related to venting of landfill gas. Landfill gas is a mix of different gases created by the action of microorganisms within a landfill. Landfill gas typically consists of mostly methane, which is odorless, and carbon dioxide; therefore, no odors are expected from the vented landfill gas.

The venting of landfill gas to control subsurface landfill gas migration is a common practice for closed landfills, in part because landfill gas generation decreases after landfill closure. The Landfill ceased receiving waste in 1972. As such, landfill gas generation has been decreasing for over 40 years. Closed landfills of similar size, operational history, and proximity to residences that are located in Massachusetts have included the installation of passive landfill gas vents and/or passive landfill gas vent trenches and have not resulted in odor nuisances at the adjacent residences. In addition, the proposed southern gas vent trench vents are located over 140 feet from the nearest residence.

Historically, the Town has collected ambient air quality samples at seven monitoring locations on and around the former ball fields located at the Landfill until the end of 2016 when the Town closed the athletic fields. The detectable concentrations of volatile organic compounds (VOCs) in the ball field sampling were generally consistent with the background sample concentrations.

Based upon previous monitoring results and the continued decrease of landfill gas generation, as well as experience with passive landfill gas venting at other closed landfills, nuisance odors associated with the southern landfill gas vent trench are not expected. Following completion of

the landfill capping project, environmental monitoring of the site will continue pursuant to a comprehensive Post-Closure Monitoring and Maintenance Plan (the PCMMP) for the Landfill that will include landfill gas monitoring at a network of locations around the site. The Final Decision (Condition 5.g) requires submittal of the PCMMP for MassDEP review and approval.

Comment 2:
One commenter expressed concern about management of excavated wetland soils impacted with arsenic as related to the control of free liquids, dust and odors.

MassDEP Response:
As part of the Application review, MassDEP has considered the management of excavated arsenic impacted wetlands soils. The Supplemental Information prepared and submitted by CDM Smith to support the Application provides procedures for managing excavated soil in the event the soils contain free liquids. The wetland soils will be allowed to dry until they contain no free liquids and the generation of dust is not anticipated during the drying process. Once dried, the soils will be taken to the Landfill for placement and covered with 6 inches of cover soil.

As stated in the Response to Public Comments prepared by CDM Smith dated November 15, 2018, procedures for the control of potential odors associated with excavated wetland soils have been included in the CAD technical specifications for the project. The excavation contractor will be required to have a masking agent available during soil relocation in the event that nuisance odors exist. As stated above, the relocated wetland soils will be covered with 6 inches of cover soils which will also limit the potential for odors at the Landfill.

Comment 3:
One commenter expressed concern the landfill cap would sustain settlement damage as a result of large equipment being staged or travelling through the proposed DPW Yard area, and acknowledged that the preloading plan (to induce and manage landfill settlement during closure construction) is to be submitted and approved to MassDEP.

MassDEP Response:
MassDEP has considered the effects that the proposed DPW Yard operations may have on the landfill cap. The Application includes a geotechnical evaluation that assessed the effect of proposed DPW soil stockpiles on the cap and found the limited settlement caused by the stockpiles will have no substantial effect on the landfill cap. The proposed surface treatment within the DPW Yard area (pavement or alternative gravel surface) will prevent or limit rutting of the cap system and thus prevent potential damage of the cap's low permeability membrane layer that could be caused by either transient loading or direct contact with heavy equipment.

Comment 4:
Several commenters expressed concern about the management of storm water at the Landfill, compliance with Massachusetts Storm Water Standards and whether the proposed project will significantly increase the potential contamination from storm water runoff.

MassDEP Response:
The proposed storm water management system associated with the Landfill Closure and DPW Yard project has been designed to collect and treat storm water from the site prior to discharge. As proposed, the system has been designed to treat a volume of runoff equal to one inch multiplied by the total impervious area, and Best Management Practices have been incorporated to comply with the storm water standard for Land Use with Higher Potential Pollutant Load. The approved design includes two storm water basins (north and south) and a replicated wet meadow on the eastern edge of the landfill cap. The wet meadow outlet discharges to the south storm water basin via a swale. Storm water from vegetated cap areas will be directed to storm water ponds via berms and let-down channels. Some storm water will sheet flow to land adjacent to the cap. Storm water from the DPW yard will primarily be managed via storm water catch basins and inline separators that discharge to the storm water basins.

The design of the proposed storm water management system has gone through extensive review by the Andover Conservation Commission and the Commission's peer reviewer LEC Environmental Consultants, Inc., as well as MassDEP. The Conservation Commission issued an Order of Conditions (OOC) for the project on May 23, 2017, and a Superseding Order of Conditions (SOC) was issued by MassDEP on April 17, 2018 (MassDEP Wetlands File #90-1281). In the SOC, MassDEP concurred that the drainage from this project meets the Massachusetts Stormwater Management Standards.

As discussed below in the Conclusion section of this RTC, MassDEP is including a condition in its Final Decision that requires the Town to submit an update to its Operation and Maintenance Plan for the DPW materials handling area and a Storm Water Pollution Prevention Plan (SWPPP) for the site that includes, without limitations, procedures for the control and prevention of spills at the DPW Yard.

Comment 5:
All of the commenters expressed concern over the impact of truck traffic from the project on the traffic in the area of the Landfill including, but not limited to, Greenwood Road, Chandler Road, River Road, and North Street. The concerns included public safety of pedestrians along proposed access routes and truck exhaust.

MassDEP Response:
MassDEP does not have independent jurisdiction under its solid waste regulations relating to traffic related concerns, but in the event that a project is subject to review under the Massachusetts Environmental Policy Act (MEPA), MassDEP does incorporate into its approvals any traffic findings or conditions required by the Executive Office of Energy and Environmental Affairs (EOEEA) through its MEPA process.

As part of the Environmental Notification Form submitted in August 2016 to the EOEEA MEPA Office (MEPA Office), a traffic analysis evaluated potential traffic routes to and from the Landfill. The ENF Certificate issued by the MEPA Office on November 4, 2016, recognized the recommended route and three alternative routes, and required time of day restrictions on the three alternative routes. The Response to Public Comments prepared by CDM Smith dated November 15, 2018, requirements regarding truck routes stated in the ENF Certificate have been included in the project specifications.

The Town also noted that additional truck traffic is not expected during operation of the DPW Yard.

Comment 6:
One commenter expressed concern that the CAD application does not describe a Financial Assurance Mechanism (FAM) addressing post-closure monitoring and maintenance.

MassDEP Response:
Pursuant to the Massachusetts Solid Waste Regulations at 310 CMR 19.051(2)(e), MassDEP may require the owner or operator of a facility to establish and continuously maintain adequate financial assurance so that the owner or operator is at all times financially capable of complying with the provisions of 310 CMR 19.000. However, consistent with the closure of solid waste landfills at other municipally-owned sites, MassDEP is not requiring a post-closure FAM for the Ledge Road Landfill at this time.

Comment 7:
Some commenters expressed concerns about family and/or neighborhood health issues, including respiratory issues, and noise impacts potentially created by truck traffic to and from the DPW Yard and operations at the DPW Yard.

MassDEP Response:
MassDEP acknowledges the concerns expressed by the commenters.

The Town's Summary Minutes from the September 12, 2017 public meeting relative to the Landfill Closure project state that the construction specifications will require all trucks and construction equipment working on the project to have diesel retrofits. Regarding operations at the DPW Yard, the Town also refers to an existing Town policy that any new DPW trucks/equipment will be purchased with the best available control technology for emissions.

III. CONCLUSION

After review of all comments received, MassDEP has made a final decision to issue the Landfill Closure and Post Closure Use permit. MassDEP has prepared this document, known as the Response to Comments or RTC, which describes and addresses any significant comments on the Provisional Decision raised during the comment period and provides MassDEP's responses.

MassDEP's decision-making process has benefitted from the review of the Public Comments and additional information submitted.

In consideration of the Public Comments, MassDEP has made the following change to the Provisional Decision:

1. MassDEP is including a condition in its Final Decision that requires the Town to submit, within ninety (90) days of the effective date of the Final Decision, an update to its Operation and Maintenance Plan to include the DPW materials handling area and a Storm Water Pollution Prevention Plan (SWPPP) for the site that includes, without limitations, procedures for the control and prevention of spills at the DPW yard area.

The Draft Application Review Fact Sheet has also been updated to reflect the Public Comment process. Therefore, MassDEP is issuing the Final Decision simultaneously with this RTC.

MassDEP is providing the Final Decision, Fact Sheet and this RTC to the Town (Department of Public Works and Board of Health), the City of Lawrence Board of Health and Commenters. A hard copy of the Public Comments received by MassDEP is available for review at the MassDEP Northeast Regional Office. Copies of the Final Decision also may be obtained by writing or calling MassDEP between the hours of 8:45 AM and 5:00 PM, Monday through Friday, excluding holidays:

Mark G. Fairbrother, Solid Waste Section Chief
MassDEP – Northeast Regional Office
205B Lowell Street
Wilmington, MA 01887

Telephone number: (978) 694-3200
mark.fairbrother@mass.gov

In accordance with the Public Involvement Plan (PIP) for the Landfill, the Final Decision, Fact Sheet and Response to Comment documents will be added by the Town to the Information Repository. These documents can be viewed by the public at either of the two Information Repositories established for this project:

Andover Memorial Library 1 Elm Square Andover, MA 01810	and	Andover Board of Health 36 Bartlet Street Andover, MA 01810

A copy of this information will also be placed in the Project eRoom maintained by the Town's consultant, CDM Smith, Inc.

17

Bk 17764 Pg1 #9359
06-16-2023 @ 11:40a
Essex North Registry

AMENDED ORDER OF CONDITIONS

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40
AND ARTICLE XIV, ANDOVER WETLANDS PROTECTION BY-LAW

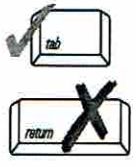
Provided by MassDEP:
090-1281 Amended
MassDEP File #

eDEP Transaction #

Andover
City/Town

A. General Information

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



1. From: Andover
Conservation Commission

2. This issuance is for (check one): a. ☐ Order of Conditions b. ☒ Amended Order of Conditions

3. To: Applicant:

a. First Name | b. Last Name

Town of Andover Municipal Services
c. Organization

5 Campanelli Drive
d. Mailing Address

Andover | MA | 01810
e. City/Town | f. State | g. Zip Code

4. Property Owner (if different from applicant):

a. First Name | b. Last Name

c. Organization

d. Mailing Address

e. City/Town | f. State | g. Zip Code

5. Project Location:

10 Ledge Road | Andover
a. Street Address | b. City/Town

Map 147 Lots 2,4,4D and 7 and Map148 Lots 7,8,9,10A, 11, 11A, 12A and 13
d. Parcel/Lot Number

Latitude and Longitude, if known: 42.6714 | 71.1912
d. Latitude | e. Longitude

This document consists of pages.

A. General Information (cont.)

6. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):

Essex North District
a. County

b. Certificate Number (if registered land)

13971
c. Book

71
d. Page

7. Dates: November 21, 2022 (a. Date Request for Amendment) December 20, 2022 (b. Date Public Hearing Closed) January 5, 2023 (c. Date of Issuance)

8. Final Approved Plans and Other Documents (attach additional plan or document references as needed):

Ledge Road Landfill Closure Project
a. Plan Title

CDM Smith
b. Prepared By

Nathan E. Jones
c. Signed and Stamped by

11/1/22
d. Final Revision Date

As noted
e. Scale

Amendment to OOC
f. Additional Plan or Document Title

11/21/22
g. Date

B. Findings

1. Findings pursuant to the Massachusetts Wetlands Protection Act:

Following the review of the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act (the Act). Check all that apply:

a. ☒ Public Water Supply b. ☐ Land Containing Shellfish c. ☒ Prevention of Pollution
d. ☒ Private Water Supply e. ☒ Fisheries f. ☒ Protection of Wildlife Habitat
g. ☒ Groundwater Supply h. ☒ Storm Damage Prevention i. ☒ Flood Control

2. This Commission hereby finds the project, as proposed, is: (check one of the following boxes)

Approved subject to:

a. ☒ the following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.

B. Findings (cont.)

Denied because:

b. ☐ the proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect the interests of the Act, and a final Order of Conditions is issued. **A description of the performance standards which the proposed work cannot meet is attached to this Order.**

c. ☐ the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the Act's interests, and a final Order of Conditions is issued. **A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).**

3. ☐ Buffer Zone Impacts: Shortest distance between limit of project disturbance and the wetland resource area specified in 310 CMR 10.02(1)(a) _____ a. linear feet

Inland Resource Area Impacts: Check all that apply below. (For Approvals Only)

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. ☒ Bank	270 perm 130 temp	270 perm 130 temp	550 new 130 rest.	550 new 130 rest.
5. ☒ Bordering Vegetated Wetland	3610 perm 23700 temp	3610 perm 23700 temp	18210 repl 23700 rest	18210 repl 23700 rest
6. ☒ Land Under Waterbodies and Waterways	3970 perm 7710 temp	3970 perm 7710 temp	830 repl 7710 rest	830 repl 7710 rest
	e. c/y dredged	f. c/y dredged		
7. ☐ Bordering Land Subject to Flooding	a. square feet	b. square feet	c. square feet	d. square feet
Cubic Feet Flood Storage	e. cubic feet	f. cubic feet	g. cubic feet	h. cubic feet
8. ☒ Isolated Land Subject to Flooding	22300 perm a. square feet	22300 b. square feet		
Cubic Feet Flood Storage	31420 c. cubic feet	31420 d. cubic feet	32910 e. cubic feet	32910 f. cubic feet
9. ☐ Riverfront Area	a. total sq. feet	b. total sq. feet		
Sq ft within 100 ft	c. square feet	d. square feet	e. square feet	f. square feet
Sq ft between 100-200 ft	g. square feet	h. square feet	i. square feet	j. square feet

B. Findings (cont.)

Coastal Resource Area Impacts: Check all that apply below. (For Approvals Only)

	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below			
11. ☐ Land Under the Ocean	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
12. ☐ Barrier Beaches	Indicate size under Coastal Beaches and/or Coastal Dunes below			
13. ☐ Coastal Beaches	a. square feet	b. square feet	c. nourishment (cu yd)	d. nourishment (cu yd)
14. ☐ Coastal Dunes	a. square feet	b. square feet	c. nourishment (cu yd)	d. nourishment (cu yd)
15. ☐ Coastal Banks	a. linear feet	b. linear feet		
16. ☐ Rocky Intertidal Shores	a. square feet	b. square feet		
17. ☐ Salt Marshes	a. square feet	b. square feet	c. square feet	d. square feet
18. ☐ Land Under Salt Ponds	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
19. ☐ Land Containing Shellfish	a. square feet	b. square feet	c. square feet	d. square feet
20. ☐ Fish Runs	Indicate size under Coastal Banks, Inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above			
	a. c/y dredged	b. c/y dredged		
21. ☐ Land Subject to Coastal Storm Flowage	a. square feet	b. square feet		

B. Findings (cont.)

* **#22.** If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.5.c (BVW) or B.17.c (Salt Marsh) above, please enter the additional amount here.

22. ☐ Restoration/Enhancement *:

a. square feet of BVW | b. square feet of salt marsh

23. ☐ Stream Crossing(s):

a. number of new stream crossings | b. number of replacement stream crossings

C. General Conditions Under Massachusetts Wetlands Protection Act

The following conditions are only applicable to Approved projects.

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
   a. the work is a maintenance dredging project as provided for in the Act; or
   b. the time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order.
6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not extend the issuance date of the original Final Order of Conditions and the Order will expire on unless extended in writing by the Department.
7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.
8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.

C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work.

10. A sign shall be displayed at the site not less then two square feet or more than three square feet in size bearing the words,

    "Massachusetts Department of Environmental Protection" [or, "MassDEP"]

    "File Number 090-1281 "

11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before MassDEP.

12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.

13. The work shall conform to the plans and special conditions referenced in this order.

14. Any change to the plans identified in Condition #13 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.

15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.

16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.

17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.

C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

18. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

NOTICE OF STORMWATER CONTROL AND MAINTENANCE REQUIREMENTS

19. **The work associated with this Order (the "Project") is** (1) ☒ **is not** (2) ☐ **subject to the Massachusetts Stormwater Standards. If the work is subject to the Stormwater Standards, then the project is subject to the following conditions:**

a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Construction General Permit as required by Stormwater Condition 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.

b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that:
i. all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures;
ii. as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized;
iii. any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10;
iv. all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition;
v. any vegetation associated with post-construction BMPs is suitably established to withstand erosion.

C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 18(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement) for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMP Operation and Maintenance Plan ("O&M Plan") and certifying the following: *i.*) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and *ii.*) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.

d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Multi-Sector General Permit.

e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 18(f) through 18(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 18(f) through 18(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.

f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.

C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

g) The responsible party shall:
1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.

h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.

i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.

j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.

k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.

l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

Special Conditions (if you need more space for additional conditions, please attach a text document):

D. Findings Under Municipal Wetlands Bylaw or Ordinance

1. Is a municipal wetlands bylaw or ordinance applicable? ☒ Yes ☐ No

2. The Andover (Conservation Commission) hereby finds (check one that applies):

   a. ☐ that the proposed work cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw, specifically:

   _____ (1. Municipal Ordinance or Bylaw) _____ (2. Citation)

   Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order of Conditions is issued.

   b. ☒ that the following additional conditions are necessary to comply with a municipal ordinance or bylaw:

   Andover Wetlands Protection By-Law (1. Municipal Ordinance or Bylaw) By-Law (2. Citation)

3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.

   The special conditions relating to municipal ordinance or bylaw are as follows (if you need more space for additional conditions, attach a text document):

See Special Conditions Attached

LEDGE ROAD LANDFILL CLOSURE PROJECT

DEP FILE NO. 090-1281 SPECIAL CONDITIONS

Findings:

1. FINDING - NOTICE OF JURISDICTION UNDER THE MASSACHUSETTS WETLANDS PROTECTION ACT, M.G.L.C. 131, S. 40. The Andover Conservation Commission hereby finds that all or part of the property on which the work authorized by this Order is proposed is subject to jurisdiction under the Massachusetts Wetlands Protection Act, M.G.L.C. 131, s. 40. The owner is hereby notified of his or her responsibility to comply with the provisions of that statute. This condition shall remain in effect in perpetuity and shall survive the issuance of a Certificate of Compliance. **This finding shall remain in effect in perpetuity and shall survive the issuance of a Certificate of Compliance.**

2. FINDING - NOTICE OF JURISDICTION UNDER THE ANDOVER WETLAND PROTECTION BYLAW. The Andover Conservation Commission hereby finds that all or part of the property on which the work authorized by this Order is proposed is subject to jurisdiction under the Andover Wetlands Protection Bylaw, Article 14. The owner is hereby notified of his or her responsibility to comply with the provisions of that statute. This condition shall remain in effect in perpetuity and shall survive the issuance of a Certificate of Compliance. **This finding shall remain in effect in perpetuity and shall survive the issuance of a Certificate of Compliance.**

3. OTHER JURISDICTIONS. The project is subject to the 310 CMR 19: Massachusetts Solid Waste Regulations and accordingly is subject to Massachusetts Department of Environmental Protection (MassDEP) Division of Solid Waste Approval. In addition, remediation of arsenic-impacted wetland soils is subject to 310 CMR 40: the Massachusetts Contingency Plan (MCP) and must be performed under the direction of an LSP. The project shall proceed in accordance with MassDEP and LSP approvals

4. FINDING – ANDOVER WETLAND PROTECTION BYLAW. The Andover Conservation Commission finds that all conditions set forth in this Order of Conditions are necessary to protect the interest described in the Andover Wetland Protection Bylaw. The Commission makes the Finding that the proponent has provided the Commission with a suitable notification (in the form of a Notice of Intent, Stormwater report, and other documents cited in this Order). Furthermore, the Commission makes the Finding that the proposed work reviewed by the Commission and their peer reviewers, and approved by this Order conforms to performance standards and design specifications in the regulations adopted by the Commission.

5. WORK AUTHORIZED UNDER THIS ORDER – Only work explicitly described in the on the Plans referenced on Page 2, Section A.8. of the Order of Conditions and to the following documents and materials that were partially relied upon by the Commission to issue this Order of Conditions. To the extent that the information contained in the reports and on the plans differ, the plans control. If necessary, direction or clarification may be sought from the Conservation Agent or the designated Environmental Monitor.

   5.1 CDM Smith, 2016a. Notice of Intent, Andover Ledge Road Closure Project, November 15,

2016.

5.2 CDM Smith, 2016b. Supplemental Information RE Boundary of Isolated Land Subject to Flooding (ILSF) Notice of Intent - Ledge Road Landfill Closure Project (November 15, 2016), November 23, 2016.

5.3 CDM Smith, 2016c. Withdrawal of Waiver Request, Notice of Intent, DEP File No. 090-1281, December 27, 2016.

5.4 Email response from applicant dated January 17, 2017 to public inquiry from Ms. Stacey Albuquerque dated January 7, 2017.

5.5 Email response from CDM Smith on behalf of applicant dated January 29, 2017 to questions from Commissioner Alix Driscoll dated January 9, 2017.

5.6 CDM Smith, 2017a. Response to Peer Reviews, February 20, 2017.

5.6a CDM Smith, 2017b. Response to LEC's Comments, February 20, 2017.

5.6b CDM Smith, 2017c. Response to Initial Stormwater Peer Review Comments, February 20, 2017.

5.7 Email response from applicant dated February 22, 2017 to public comments received by the Andover Conservation Commission on January 3, 2017 from Mr. Keith Saxon.

5.8 CDM Smith, 2017d. Response to Second Notice of Intent Peer Review Comments, March 31, 2017.

5.9 CDM Smith 2017e. Responses to Conservation Commission Comments, April 4, 2017.

5.10 CDM Smith, 2017f. Final Stormwater Management Report, Ledge Road Landfill Closure and Post-Closure Use, Andover, Massachusetts, September 2016, Revised April 13, 2017.

5.11 Andover Department of Municipal Services Christopher Cronin Letter dated May 8, 2017.

6. FINIDING – RELIANCE UPON PEER REVIEW. The Conservation Commission is in partial reliance upon a peer review of the filing completed by Thomas Peragallo, CPSS of LEC Environmental Consultants, Inc. (LEC) and Daniel MacRitchie, PE of D. C. MacRitchie Inc. (MacRitchie). The documentation for this review is comprised of the following letter reports and/or their representations at Working Sessions held on February 2, 2017 and April 13, 2017 or during Public Hearings.

6.1 LEC Notice of Intent Peer Review dated January 24, 2017.

6.2 MacRitchie Initial Peer Review and Recommendations dated January 24, 2017

6.3 LEC Notice of Intent Peer Review dated March 6, 2017.

6.4 MacRitchie Second Peer Review and Recommendation March 9, 2017

6.5 LEC Email Correspondence dated April 25, 2017.

6.6 LEC Notice of Intent Peer Review dated May 3, 2017.

6.7 MacRitchie Final Peer Review May 3, 2017.

The Commission and its consultants, in evaluating the Notice of Intent submittal and supporting documents, have relied solely upon the data and representations made by the Applicant and its representatives. Accordingly, the Applicant shall indemnify and save harmless the Commission, its consultants, Agents, and the Town of Andover against any and all claims arising out of or in connection with any work or structures authorized herein. Any discrepancies, errors or omissions discovered may result in revocation, suspension or modification of this Order without liability to the municipality or its consultants or Agents.

7. FINDING – LIMITED PROEJCT. The Commission finds that the Proposed Project qualifies as a Limited Project in accordance with 310 CMR 10.53 (3) (p) and (q) of the Wetlands Protection Act Regulations and Section 4 (4) of the Andover Wetland Protection Regulations.

8. FINDING - BORDERING VEGETATED WETLAND. The Conservation Commission finds that the site contains a Bordering Vegetated Wetland and relied upon an Order of Resource Area Delineation (DEP File # 090-1255) issued by the Commission on December 7, 2015 approving the boundary of Bordering Vegetated Wetland as shown on an ANRAD Plan prepared by RJ O'Connell & Associates, Inc. dated 7-19-13. Additional BVW was delineated as part of the NOI Application and the Commission relied upon a Wetland Boundary Peer Review conducted by Thomas A. Peragallo to review/modify and confirm the accuracy of the BVW as depicted on the site plans.

9. FINDING - INTERMITTENT STREAM. The Conservation Commission finds that the site contains Bank and Land Under Waterway associated with intermittent streams and relied upon an Order of Resource Area Delineation (DEP File # 090-1255) issued by the Commission on December 7, 2015 confirming the streams are intermittent and relied upon additional review as part of the NOI Application conducted by Thomas A. Peragallo to review/modify and confirm the accuracy of Bank and Land Under Waterway as depicted on the site plans.

10. FINDING –ISOLATED LAND SUBJECT TO FLOODING. The Conservation Commission finds that the site contains Isolated Land Subject to Flooding (ILSF) and relied upon an Order of Resource Area Delineation (DEP File # 090-1255) issued by the Commission on December 7, 2015 to confirm the limits of ILSF.

11. FINDING – BVW, BANK, LAND UNDER WATER AND ILSF/IVW IMPACTS. The Andover Conservation Commission finds that the Applicant proposes to alter a total of up to 27,310 square feet (sf) of BVW (3,610 permanent + 23,700 temporary), 400 linear feet of Bank (270 permanent + 130 temporary), 11,680 (sf) of Land Under Water (3,970 permanent + 7,710 temporary) and 31,420 cubic yards (cy) of ILSF flood storage, and 22,300 sf of IVW for closure of the landfill and removal of contaminated soils within the BVW and Intermittent stream.

The BVW impacts will be mitigated through the restoration of temporarily impacted wetlands (23,700 sf) and the creation of a 18,210 sf Wetland Replication Area. The Bank impacts will be mitigated through restoration of 130 linear feet of Bank and creation of 550 linear feet of Bank in the Wetland Replication Area, resulting in a net increase of 280 linear feet of Bank. The temporary LUW impacts will be mitigated by restoration of 7,710 sf LUW and creation of 830 sf of LUW in the Wetland Replication Area. **Permanent impacts to LUW will not be fully mitigated resulting in a net loss of 3,140 sf of LUW.** The temporary loss of 31,420 cy of ILSF will be mitigated by restoring 32,910 cy of ILSF storage capacity.
Mitigation for loss of the 22,300 sf of IVW remains an open item for discussion by the Commission at the May 11, 2017 Public Hearing.

The Commission finds that the above mitigation is an appropriate approach to providing restoration, replication, and/or mitigation to offset these impacts based on the circumstances of this project, the mitigation provided, the functions and values of the Freshwater Wetland, and the site constraints particular to this site.

The above impact calculations include a 15% contingency for impacts to BVW, Bank, and Land Under Water (LUW) to be field verified during construction. For resource areas outside those shown on the project plans, the applicant shall adhere to the Administrative Protocol included in the Response to LEC's Comments (CDM Smith, 2017b).

12. FINDING – 50-FOOT NON DISTURBANCE ZONE. The entire project site is located within the Fish Brook Watershed and the Andover Watershed Protection Overlay District. Therefore, the Andover Conservation Commission finds that the site is subject to the increased No-Disturbance Zone of 50-feet. The Commission relied upon an Order of Resource Area Delineation (DEP File # 090-1255) issued by the Commission on December 7, 2015 for this Finding.

13. FINDING - PERMANENT NO DISTURBANCE SIGNAGE. The Andover Conservation Commission hereby finds that **prior to issuance of a Certificate of Compliance or cessation of inspections by the Environmental Monitor**, No Disturbance Signage bearing the following inscription: "50 FOOT NON-DISTURBANCE ZONE TO WETLAND. PER ORDER OF ANDOVER CONSERVATION COMMISSION. DO NOT REMOVE." shall be installed every 50-feet along the 50-foot No Disturbance Boundary. The condition will be enforceable by the Andover Conservation Commission against the owner and /or its successors. **This signage and post-and-rail fences shall be maintained in good condition and this requirement shall remain in effect in perpetuity and shall survive the issuance of a Certificate of Compliance.**

14. FINDING 50 FOOT NON-DISTURBANCE ZONE REQUIRED DEED LANGUAGE. Prior to issuance of Certificate of Compliance Any Deed (as defined below) for all or any portion of the property subject to this Order of Conditions which includes a non-disturbance zone shall be recorded at the Registry of Deeds and contain the following language:

    "This property is subject to a non-disturbance zone in which no alteration of land or vegetation may occur. The non-disturbance zone is shown on the plans entitled _____, recorded at the Essex County Registry of Deeds, North District,

at Book ___, Page ___, and/or registered with the Land Registration Office of the Essex County Registry District as Document No._____ and as described in the Order of Conditions recorded in the same Registry at Book ____, Page ____, and/or in the same Registry District as Document ____. In accordance with said Order of Conditions, this language shall be incorporated in full into all future deeds, easements, mortgages, leases, licenses, occupancy agreements or any other instrument of transfer, whereby an interest in and/or a right to use the property or a portion thereof is conveyed (a "Deed")."

The plans referenced in this Order of Conditions shall be recorded with the Order of Conditions and cross referenced thereto in the Essex County Registry of Deeds and/or the Essex County Registry District. **This finding shall remain in effect in perpetuity and shall survive the issuance of a Certificate of Compliance.**

15. FINDING – DIGITAL FILE FOR WETLAND RESOURCES. Prior to commencement of work, the applicant shall provide to the Andover Conservation Commission a digital file containing the file of the confirmed boundary of resource areas. The file format shall be in AutoCAD DWG (or ASCII DXF) version 2010 or earlier and Adobe PDF, delivered on CD-ROM or DVD-R media. AutoCAD file delivery shall be in full model view. The digital file shall include property boundaries, dimensions, easements, rights-of-way, edge of pavement, edge of side walk, edge of water bodies, wetland boundaries, topographic contours, spot elevations, etc. Said digital data shall be delivered in Massachusetts State Plane Coordinate System, North American Datum 1983 and North American Vertical Datum 1988, in U.S. Survey Feet.

16. FINDING – LAWN/LANSCAPE CHEMICALS WITHIN 100 FEET OF WETLAND. The Conservation Commission finds that in order to minimize the potential for adverse impacts on water quality, the use of <u>any</u> type of lawn or landscape chemical, pesticide or herbicide is prohibited in the 25-foot Non-Disturbance Zone and only organic, slow release, low-nitrogen type and phosphorous free fertilizers or herbicides are allowed within the area 75-100 feet horizontally from the boundary of Bordering Vegetated Wetland depicted on the approved plans. **This condition will be enforceable by the Andover Conservation Commission against the owner and/or its successors. This condition shall remain in effect in perpetuity**.

17. FINDING – **Prior to commencement of work**, the plans referenced in this Order of Conditions shall be recorded with the Order of Conditions and cross referenced thereto in the Essex County Registry of Deeds and/or the Essex County Registry District. **This finding shall remain in effect in perpetuity and shall survive the issuance of a Certificate of Compliance.**

<u>Special Conditions:</u>

18. All materials required to be submitted to the Commission shall also be submitted to the Environmental Monitor for review and approval. For the purposes of this order the Environmental Monitor functions as an Agent of the Commission.

19. This Order of Conditions shall be made part of all construction documents for this project. This document shall be included in all construction contracts including subcontracts dealing with

work proposed and shall supersede any conflicting contract requirements. All contractors working at the site shall be made aware of the provisions contained within this Order of Conditions and shall adhere to all the Special Conditions contained herein. The applicant, or his designee, shall, at all times, have a copy of the Final Order of Conditions at the site and shall monitor compliance with the provisions of this Order.

20. Until the Certificate of Compliance to this Order is issued, a Conservation Commissioner or an Agent of the Commission reserves the right to enter and inspect the property at reasonable times in order to evaluate compliance with this Order and any instructions or orders issued pursuant to this Order. Such parties may require any information, measurements, photographs and/or materials or may require any additional information deemed necessary for that evaluation. Further, work shall be halted onsite if the Conservation Commissioner or agent of the Commission determines that any of the work is not in compliance with the Order. Work shall not resume until the Commission is satisfied that the work will comply with the Order and has so notified the applicant in writing.

21. This Order shall apply to any successor in control in interest of the property described in the Notice of Intent and accompanying plans, and to any contractor or other person performing work conditioned by this Order. These obligations shall be expressed in all deeds to succeeding owners of all or portions of the property. (This is in addition to DEP's Standard Condition under B. Findings, General Conditions 16.).

Pre-Construction

22. Prior to commencement of work, the applicant shall have received all other required federal, state, and/or local permits required by law including, if necessary, but not limited to an EPA NPDES Stormwater Permit.

23. Prior to commencement of work, the sign displayed according to B. Findings General Condition 10 must say **DEP & ACC File No. 090-1281**. This sign is not to be attached to a living tree.

24. Prior to the commencement of any work onsite, the limits of all wetland resource areas shall be re-established with surveyors tape. Once established, said markers shall be checked and replaced as necessary and shall be maintained until all construction has been completed and a Certificate of Compliance has been issued. Note: This is in addition to DEP's Standard Condition under B. Findings, General Condition 17.

25. The contractor responsible for the project's completion shall be notified of, and understand, the requirements of this Order of Conditions. The contractor shall acknowledge receipt of the Order of Conditions by submitting a letter to that effect to the Conservation Commission. A copy of this Order, as well as copies of the above-mentioned documents, plans, and reports shall be on-site while activities regulated by this Order are being performed.

26. EROSION CONTROLS - Prior to commencement of work, the erosion control line shall be staked in the field by a Professional Land Surveyor for inspection by the Commission or an Agent of the Commission prior to installation of the erosion controls. Following approval of the staked limits of the erosion control boundary, the erosion controls shall be installed to prevent

the transport of silt or sediment beyond the limits-of-work.. All siltation and erosion controls shall be installed as specified on the Plan. A written request for inspection of the erosion control shall be submitted to the Conservation Commission and the Environmental Monitor, and a satisfactory inspection performed before any land-disturbing activity may commence. This inspection may be coupled with the pre-construction meeting referenced in Special Condition 28.

The Conservation Commission or its Agents may require other sediment controls as field conditions warrant. The siltation control device shall be the Limit of Construction beyond which no earth-disturbing activity shall occur or heavy equipment shall be allowed. All siltation and erosion controls shall be maintained in a state of good repair. The siltation control devices shall not be removed until the Commission or its Agent has reviewed and found satisfactory the stabilization of the disturbed area.

At all times during construction, the Applicants shall maintain an on-site stockpile of erosion controls sufficient to respond to any emergency problem that may arise. Such stockpile must be replenished as it is used.

27. CONSTRUCTION OVERVIEW BY DESIGN ENGINEER / REPORTS. In accordance with Massachusetts General Laws Chapter 44, §53G, the Conservation Commission requires that the applicant provide funds **prior to commencement of work** to the Commission for the reasonable fees of a consultant with professional credentials to be selected by the Commission to review and/or approve the inspection of work thereunder. Such fees shall be an estimate of inspections which shall take place during once every 7 calendar days and within 24 hours of the end of a storm event having ½ inch of rainfall or greater within a twenty-four hour period, throughout the duration of the project. This period shall begin when siltation controls are installed, and shall end with issuance of a Certificate of Compliance. **Since the fees are an estimate, additional fees may be required pending the duration of the project and/or overpayment returned to the applicant upon the issuance of a Certificate of Compliance.**

    Where submission of a certified foundation plan is otherwise required under this Order of Conditions a copy of said certified foundation plan shall be attached to the next inspection report following installation of the foundation. The weekly logs/reports shall be submitted on a monthly basis to the Conservation Commission and shall state whether such work is in his or her opinion in compliance with the Order of Conditions. The Conservation Commission reserves the right to require submission of such reports on a more frequent interval. **The Conservation Commission also reserves the right to authorize the consultant to reduce the number of weekly inspections submitted on a monthly basis at their discretion.**

    The applicant must request approval for temporary cessation of reports in writing prospectively. **This request must have the prior approval of an Agent for the Commission.** Failure to submit satisfactory reports shall be deemed sufficient cause for revocation of this permit without further review

28. Not more than 2 weeks prior to the commencement of work, a **Pre-Construction Meeting** shall be held with the Conservation Agent and the Commission's Environmental Monitor, and the

Applicant's On-Site Construction Manager, Project Engineer and/or Wetland Scientist to review and discuss the Order of Conditions, construction procedures, methods, and erosion controls. Prior to requesting the pre-construction meeting, the applicant shall submit the following to the Conservation Commission:

a. A statement that the items enumerated in Special Conditions 15, 17, and 22 through 27 have been executed and the required supporting information has been provided to the Commission;

b. The names and 24-hour, 7 days/week phone numbers of the on-site construction manager(s) who are responsible to coordinate the construction and ensure compliance with this Order. This list shall be resubmitted if any changes are made to it; and

c. A statement signed by the Applicant, owner of the property, and the person responsible for the construction of the project that such individuals understand the terms and conditions as specified in the Order and that such persons agree to comply with the referenced provisions.

29. The applicant shall notify the Conservation Commission, in writing, at least two (2) business days before any activity commences on the project site.

30. The contractor responsible for the project's completion shall be notified of, and understand, the requirements of this Order of Conditions. A copy of this Order, as well as copies of the above-mentioned documents, plans, and reports shall be on-site while activities regulated by this Order are being performed.

31. This Order of Conditions shall be made part of all construction documents for this project. All contractors working at the site shall be made aware of the provisions contained within this Order of Conditions and shall adhere to all the Special Conditions contained herein. The applicant, or his designee, shall, at all times, have a copy of the Final Order of Conditions at the site and shall monitor compliance with the provisions of this Order.

Contamination Remediation and Wetland Replication, Restoration, Mitigation

32. TIME OF YEAR RESTRICTIONS. The project shall be subject to the following time of year restrictions within temporary impact areas to wetland resource areas:

- Work within intermittent streams including preparation, excavation, backfill, and restoration will be limited to July 1 – September 30. If any tree removal (4 inches or greater in dbh [diameter in breast height]) is necessary, such work may occur outside the time of year restriction to accommodate potential federal time of year restrictions for tree removal. In such circumstances, stumps will remain in place until July 1.

- Work within BVW areas (preparation, excavation, backfill, and restoration) will be limited to June 15 – October 15, except that tree removal (4 inches or greater in dbh) may take place outside the time of year restriction to accommodate potential federal time of year restrictions for tree removal.

- Wetland replication work on the former McGrath Parcel will be limited to May 1 – October

The above restrictions do not apply to permanent impacts to wetland resource areas resulting from landfill capping.

33. The Boundaries of all contaminated soil removal proposed in Resource Areas shall be staked and confirmed by a Qualified Professional Wetland Scientist (see #3.) prior to removal. Where soil is to be removed in stream courses, stakes shall be placed at the bottom of the bank to identify the boundaries of Land Under Water and Waterways.

34. Extreme care shall be employed to ensure that the area of existing wetlands to be altered shall not exceed the limits as shown on the approved plans.

35. BYPASS PUMPING. A bypass pumping system shall be in place prior to wetland soil removal to provide the availability of the bypass pumping system should there be any flow in the intermittent streams. Such flow shall be diverted (i.e., bypass pumped) around the arsenic impacted soil removal work areas to ensure that arsenic impacted soil is contained to the removal area. Implementation of the bypass pumping should not be considered an emergency measure, as it is a necessity consistent with the Massachusetts Contingency Plan (MCP) and NPDES Construction General Permit.

36. Removal of contaminated soil in Soil Removal Areas #4 and #6 shall be performed by hand methods and/or by vacuum excavator, to insure no stream banks are disturbed. In Soil Removal Areas #4 and #6, no heavy equipment is permitted within the following resource areas: Land Under Water and Waterways, Bank and associated Bordering Vegetated Wetland.

37. All phases of construction and inspection of proposed work in wetland resource areas and the Wetland Replication Area shall be performed by a Qualified Professional Wetland Scientist shall have at least 5 years of direct experience supervising similar wetland restoration projects and the specific individual shall be approved by the Commission prior to commencement of work". The name and credentials of the individual must be submitted to the Andover Conservation Commission prior to the Pre-Construction Meeting referenced in Special Conditions 28 (above). The Qualified Professional Wetland Scientist must ensure compliance with the Order and the plans and document that disturbance is avoided or minimized to the greatest extent, and to evaluate the process upon completion.

38. The Qualified Professional Wetland Scientist shall provide specific guidance to the contractor, for access and staging of equipment and supplies, at the Wetland Replication Area, the Wetland Restoration Area (ILSF), and all soil removal and restoration areas (temporary alterations).

39. The Wetland Scientist shall make a photographic record of the pre, during, and post-construction condition of work in all Resource Areas to facilitate the Commission's review. A progress report detailing the findings and actions taken shall be submitted to the Commission at the end of each week until completion of permanent and temporary Resource Area alterations, wetland replication, and ISLF restoration.

40. As-Built Plans of the Wetland Replacement and Compensatory Storage Area which includes a certified location and calculation of the areas in square feet of the wetland replication and storage volume of the compensatory storage area, shall be submitted to, and meet the approval of the Andover Conservation Commission, prior to the issuance of any Certificates of Compliance.

41. Specific, adapted seed mixtures be identified and reported to the Andover Conservation Commission, prior to seeding and. If approved by the Commission, the seed mixtures must be applied according to the manufacturer's specifications.

42. All wetland plantings are to be performed by hand. Wetland plants are to be inspected by the Qualified Professional Wetland Scientist prior to installation to ensure proper quantity, size, and species as specified on the plans. Only native species shall be used, no cultivars. The final planting layout shall be inspected by the Commission's Agent and the Applicant's Qualified Professional Wetland Scientist prior to planting.

43. It is intended that at least 75 percent of the replication area be re-established with indigenous wetland plant species and that at least 75 percent of the woody vegetation has survived within five growing seasons of their planting. Invasive or exotic species shall not be planted or allowed to remain in the replication areas. If at any point during post construction monitoring, it is evident in the opinion of the Applicant's Qualified Professional Wetland Scientist that the above standards will not be achieved, the Applicant shall supplement the plantings as necessary to achieve the required coverage. If after the end of five growing seasons, 75 percent re-establishment has not been achieved or at least 75% of the woody plants have not survived, the Applicant shall provide healthy wetland vegetation in sufficient quantity to achieve the 75 percent re-establishment criteria as directed by the Applicant's Wetland Scientist.

44. The Applicant's Qualified Professional Wetland Scientist shall monitor the Wetland Replication Area for five consecutive growing seasons, conducting spring and fall monitoring visits to document conditions within the wetland replication area. A detailed report shall be prepared and submitted to the Commission no later than November 1st of each year during the five-year monitoring period. Each report will include an observed species list, relative abundance of each species, percent cover of upland and wetland species, the viability of the plantings, invasive species and removal recommendations, proposed remedial measures to ensure 75 percent re-establishment, and photographs.

45. Prior to the issuance of the final Certificate of Compliance for the project, the Applicant's Qualified Professional Wetland Scientist shall certify to the Commission that the replication area has achieved the 75 percent re-establishment.

Construction

46. STORMWATER MANAGEMENT. The Applicant or his successors in interest shall be responsible in perpetuity to maintain all drainage and stormwater management features, including stormwater best management practices (BMPs) in good working order. The Conservation Commission reserves the right to enter upon the property and make independent examination of these BMP measures, and to require the Applicant or his successors in interest to perform such maintenance as is needed in its judgment. The Conservation Commission shall

provide prior notice to the property owner of its intent to perform such inspection not less than forty-eight hours prior to such inspection. **This condition shall remain in effect in perpetuity and shall survive the issuance of a Certificate of Compliance.**

47. STORMWATER MANAGEMENT. The Owner shall retain a qualified professional to inspect the storm water management basins in accordance with the Stormwater Management Operation and Maintenance Plan (see attached) to ensure proper function and maintenance of the system. **This Condition shall be a continuing condition and shall not expire with the issuance of a Certificate of Compliance.**

48. EXCAVATION DEWATERING. In the event that excavation dewatering is required within any area subject to jurisdiction of the Wetlands Protection Act the applicant shall notify the Conservation Agent/Environmental Monitor in advance of such work, and shall be responsible to ensure that such water is free of suspended solids before being discharged into either a wetland or into any storm water drainage system. This condition applies to all forms of dewatering, including pumping and trenching. Any dewatering areas shall be monitored daily to ensure that sediment laden water is appropriately settled prior to discharge toward the resource areas. No discharge of water is allowed directly into any wetland resource area. Dewatering shall be performed using a settling basin and/or a silt sock ™ or approved equivalent filtering device. The filtering device shall be laid such that the end is at least 50 feet from the edge of any wetland above the sediment control line. During dewatering the device shall be monitored and replaced as needed. Sediment from the device shall be disposed of properly.

49. REFULING. Refueling of equipment onsite will be avoided when practicable. Refueling shall only occur in areas located more than 100 feet from wetland resource areas. During refueling, spill clean-up equipment (shovels, brooms, absorbent pads and materials) shall be available for use in the event of an accidental spill. In the unlikely event of a spill, the Town will immediately clean up the spill and, if reportable, will report to the proper authorities (Andover Fire Department, Andover Board of Health, Andover DPW, MassDEP, and others as applicable). There will not be any onsite storage of fuel other than in vehicle fuel tanks and small containers (5 gallons or less).

50. CLEAN FILL. All fill used in connection with this project above the flexible membrane liner solid waste cap shall be clean borrow. The following shall be prohibited: chemically contaminated material; concrete and asphalt rubble; stumps and other solid waste.

51. GRADING AND STABILIZATION. Grading shall conform to the plans and data referenced above. In all cases final grades shall have a minimum of two inches of topsoil (measured in place) over all disturbed areas. In all cases exposed soil areas shall be stabilized with vegetation, e.g., grass or some form of ground cover plant. In no case shall wood chips, mulch, or similar covering be acceptable on sloping ground in lieu of vegetation.

52. STOCKPILING. All debris, fill, and excavated material stockpiles within 100 feet of a wetland area must be surrounded by staked hay bales, straw wattles or compost logs, depending on the height of the pile and proximity to wetlands, to prevent sediment from surface runoff from entering the wetland. If soil materials are stockpiled for more than 14 days, the piles must be seeded with a rapid-cover annual grass such as Annual Rye.

53. CONTROL OF CONSTRUCTION DEBRIS. No construction debris (paper, wood, metal, concrete, etc.) may be allowed to enter the wetland resource areas at any time. Windblown material shall be promptly removed from wetland resource areas.

54. DAMAGES TO RESOURCE AREAS. Any damage caused as a direct result of this project to any wetland resource areas, beyond that authorized by the Order, is the responsibility of the applicant to repair, restore or replace. Sedimentation or erosion into these areas shall be considered damage to wetland resource areas. The Conservation Commission shall be promptly notified of any damage to wetland resource areas. Following notification, the applicant must submit a plan for abatement of the problem and restoration. This plan must be approved by the Conservation Commission prior to implementation.

55. SURPLUS EARTH MATERIALS. It shall be the responsibility of the Applicant to ensure that any and all surplus materials that are not needed for use on the project are lawfully disposed of outside any area subject to protection under M.G.L.c 131, s. 40, unless such disposal area and activity are regulated under either a valid Order of Conditions or Determination of Applicability.

56. LANDFILL POST-CLOSURE MAINTENANCE AND MONITORING. The landfill cap and lined ILSF shall be inspected and maintained in accordance with this Order of Conditions and MassDEP Solid Waste requirements including, but not limited to, mowing the cap, lined basin, and lined ILSF to prevent the growth of woody vegetation; repairing damage to the cap resulting from erosion, settlement, borrowing animals, etc.; periodically removing sediment from the lined ILSF; and performing 30-year post-closure monitoring of landfill gas, groundwater, surface water, and sediment.

57. CERTIFICATE OF COMPLIANCE. Not more than thirty days following completion of the project, the applicant shall submit with their request for a Certificate of Compliance, WPA Form 8A; an affidavit prepared by a professional engineer or land surveyor registered in the Commonwealth of Massachusetts, stating that the site has been developed in accordance with the requirements of this Order of Conditions, based upon an on-site inspection and the referenced site plan setting forth any deviations that exist and their potential effect on the project or its compliance with the Order of Conditions; and a written certification by the Applicant's Wetland Scientist/Competent Expert that the Riverfront Area Enhancement Plantings have achieved 75 percent survival and nearly 100% cover.

    An as-built drawing, prepared by a Professional Land Surveyor or Professional Engineer, registered in the Commonwealth of Massachusetts, and depicting the final and actual condition of all areas within the jurisdiction of the Massachusetts Wetlands Protection Act shall accompany such request.

    The original Certificate of Compliance signed by the Commission must be recorded at the North Essex Registry of Deeds and proof of such recording must be provided to the Commission.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 5 – Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
090-1281
MassDEP File #

eDEP Transaction #

Andover
City/Town

E. Signatures

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

Jan 5, 2023
1. Date of Issuance

Please indicate the number of members who will sign this form.
This Order must be signed by a majority of the Conservation Commission.

7
2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

Signature	Printed Name
D. Cooper	Donald Cooper
	Ellen Townson
	Jon Honea
	Floyd Greenwood
Alix Driscoll	Alix Driscoll
	Miranda Chave
	Ruby Brown

☐ by hand delivery on

Date

☒ by certified mail, return receipt requested, on January 5, 2022

Date

G. Recording Information

Prior to commencement of work, this Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

Andover
Conservation Commission

Detach on dotted line, have stamped by the Registry of Deeds and submit to the Conservation Commission.

To:

Andover
Conservation Commission

Please be advised that the Order of Conditions for the Project at:

10 Ledge Road
Project Location

090-1281
MassDEP File Number

Has been recorded at the Registry of Deeds of:

Essex North District
County

Book

Page

for:
Property Owner

and has been noted in the chain of title of the affected property in:

Book

Page

In accordance with the Order of Conditions issued on:

Date

If recorded land, the instrument number identifying this transaction is:

Instrument Number

If registered land, the document number identifying this transaction is:

Document Number

Signature of Applicant

MassDEP
Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Northeast Regional Office • 150 Presidential Way Woburn, MA 01801 • 978-694-3200

Maura T. Healey
Governor

Kimberley Driscoll
Lieutenant Governor

Rebecca L. Tepper
Secretary

Gary Moran
Acting Commissioner

March 21, 2023

Magdalena Lofstedt
c/o CDM Smith, Inc.
75 State Street, Ste. 701
Boston, MA. 02109

RE: **WETLANDS/ANDOVER**
DEP Wetlands File #90-1281
Location: 10 Ledge Road
Ledge Road Landfill
Superseding Order of Conditions
Amendment

Dear Ms. Lofstedt:

The Northeast Regional Office of the Massachusetts Department of Environmental Protection, Wetlands Program (MassDEP), has completed its review of your request for an Amended Superseding Order of Conditions (ASOC) for the referenced above site.

The revisions to the project include remove the previously proposed post closure use for the landfill site as a Department of Public Works (DPW) Materials Handling Area. Consistent with the original Notice of Intent (NOI), a potential future solar photovoltaic (PV) array is considered the preferred post closure use, and therefore 5.5 acres of the site will be graded to maximize the potential for a future solar array. This results in revised final grading with 5% (20:1) slope on top of the capped landfill, to be maintained as a grassy field. The revised Stormwater Report has been updated to take into account the elimination of the DPW Materials Handling Area and possible future solar array in that location. The proposed new impervious cover from the project has been revised downward to 0.18 acre from the previously approved 6 acres. All previously approved amounts of impacts to resource areas remain the same.

In accordance with the Wetland Protection Program Policy on Amended Orders: Amending an Order of Conditions (DWW Policy 85-4), MassDEP has determined that the proposed changes do not change the project purpose or significantly change the scope of the project. Therefore, it is MassDEP's opinion that the filing of a new Notice of Intent is not required. Six amended plan sheets from the plan set entitled "Ledge Road Landfill Closure Project, Town of Andover, Massachusetts, 100% Corrective Action Design Submittal," shall be incorporated into the Amended Order at condition 20. The revised plans were prepared by CDM and dated 11/2022. Prior to start of the work, the applicant must record this ASOC at the Registry of Deeds and provide proof of recording to MassDEP. The original Superseding Order of Conditions approving the project was issued on April 17, 2018, and is in effect through April 17, 2024.

This information is available in alternate format. Please contact Melixza Esenyie at 617-626-1282.
TTY# MassRelay Service 1-800-439-2370
MassDEP Website: www.mass.gov/dep

Printed on Recycled Paper

All Special Conditions included in the SOC for this project shall remain in full force and effect. This amendment does not change the effective date of issuance of the Superseding Order of Conditions.

Should there be any questions in this matter, please contact Mr. Philip DiPietro at philip.dipietro@mass.gov.

Sincerely,

Jill Provencal
Section Chief
Wetlands Program - NERO

cc:

MassDEP, BAW, NERO

USACE

Mr. Jose Albuquerque, 197 Greenwood Road, Andover, MA. 01860

12

Bk 17764 Pg73 #9360
06-16-2023 @ 11:40a
Essex North Registry

Massachusetts Department of Environmental Protection
Bureau of Water Resources – Wetlands Program
Amended Superseding Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

MassDEP File #
090-1281

A. General Information

1. From: Northeast Regional Office
Massachusetts Department of Environmental Protection (MassDEP/the Department)

2. This issuance is for (check one):
a. ☐ Superseding Order of Conditions
b. ☒ Amended Superseding Order of Conditions

3. To: Applicant:

Chris Cronin
a. First Name, Last Name

b. Company

Town of Andover-Municipal Services
c. Organization

5 Campanelli Drive
d. Mailing Address Line 1

Andover
e. City/Town

MA
f. State

01810
g. Zip Code

4. Property Owner (if different from applicant):

a. First Name

b. Last Name

c. Organization

d. Mailing Address Line 1

e. City/Town

f. State

g. Zip Code

5. Project Location:

10 Ledge Road
a. Street Address

Andover
b. City/Town

Map 147, Lots 2,4,4D & 7; Map 148, Lots 7,8,9,10A,11,11A,12A & 13,4E

457
d. Parcel/Lot Number

Latitude and Longitude, if known:

42.6714
e. Latitude

71.1912
f. Latitude

Massachusetts Department of Environmental Protection
Bureau of Water Resources – Wetlands Program
Amended Superseding Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

MassDEP File #

090-1281

A. General Information (cont'd)

6. Property recorded at the Registry of Deeds (attach additional information if more than one parcel):

Essex North
a. County

b. Certificate (if registered land)

13971
c. Book

71
d. Page

7. Dates: November 22, 2016 (a. Date NOI Received) May 23, 2017 (b. Date Local Order Issued) April 17, 2018 (c. Date SOC Issued)

8. Final Approved Plans and Other Documents (attach additional plans or document references):

"Ledge Road Landfill Project – 100% Corrective Action Design Submittal"
a. Plan Title

CDM Smith, Inc.
b. Prepared By

Daniel Gugliemi, Nathan Jones
c. Signed and Stamped By

April 26, 2017, revised through November 2022
d. Final Revision Date

See Special Conditions
f. Additional Plan or Document Title

g. Date

B. Findings

C. Findings pursuant to the Massachusetts Wetlands Protection Act – Following the review of the above-referenced Notice of Intent and based on the information provided in this application, the Department finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act. Check all that apply:

a. ☒ Public Water Supply b. ☐ Land Containing Shellfish c. ☒ Prevention of Pollution

d. ☒ Private Water Supply e. ☒ Fisheries f. ☒ Protection of Wildlife Habitat

g. ☒ Groundwater Supply h. ☒ Storm Damage Prevention i. ☒ Flood Control

2. This Department hereby finds the project, as proposed, is (check one):

Approved subject to:

a. ☒ the following conditions which are necessary in accordance with the performance standards set forth in the wetland regulations. The Department orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.

B. Findings (cont'd)

Inland Resource Area Impacts: Check all that apply below. (For Approvals Only)

3. ☒ Buffer Zone Impacts: Shortest distance between limit of project disturbance and wetland boundary (if available) — a. linear feet

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. ☐ Bank	a. linear feet	b. linear feet	c. linear feet	d. linear feet
5. ☐ Bordering Vegetated Wetland	a. square feet	b. square feet	c. square feet	d. square feet
6. ☐ Land Under Waterbodies and Waterways	a. square feet	b. square feet	c. square feet	d. square feet
	e. c/y dredged	f. c/y dredged		
7. ☐ Bordering Land Subject to Flooding	a. square feet	b. square feet	c. square feet	d. square feet
Cubic Feet Flood Storage	e. cubic feet	f. cubic feet	g. cubic feet	h. cubic feet
8. ☐ Isolated Land Subject to Flooding	a. square feet	b. square feet		
Cubic Feet Flood Storage	c. cubic feet	d. cubic feet	e. cubic feet	f. cubic feet
9. ☐ Riverfront area	a. total sq. feet	b. total sq. feet		
Sq feet within 100 feet	c. square feet	d. square feet	e. square feet	f. square feet
Sq feet between 100-200 feet	g. square feet	h. square feet	i. square feet	j. square feet

Coastal Resource Area Impacts: Check all that apply below. (For Approvals Only)

10. ☐ Buffer Zone Impacts: Shortest distance between limit of project disturbance and wetland boundary (if available) — a. linear feet

11. ☐ Designated Port Areas – Indicate size under Land Under the Ocean, below

	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
12. ☐ Land Under the Ocean	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		

13. ☐ Barrier Beaches – Indicate size under Coastal Beaches and/or Coastal Dunes below.

B. Findings (cont'd)

14. ☐ Coastal Beaches — a. square feet | b. square feet | c. c/y | d. c/y nourish.
15. ☐ Coastal Dunes — a. square feet | b. square feet | c. c/y | d. c/y nourish.
16. ☐ Coastal Banks — a. linear feet | b. linear feet
17. ☐ Rocky Intertidal Shores — a. square feet | b. square feet
18. ☐ Salt Marshes — a. square feet | b. square feet | c. square | d. square feet
19. ☐ Land Under Salt Ponds — a. square feet | b. square feet | c. c/y dredged | d. c/y dredged
20. ☐ Land Containing Shellfish — a. square feet | b. square feet | c. square | d. square feet

21. ☐ Fish Runs – Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above — a. c/y dredged | b. c/y dredged

22. ☐ Land Subject to Coastal Storm Flowage — a. square feet | b. square feet
23. ☐ Riverfront area — a. total sq. feet | b. total sq. feet

Sq feet within 100 feet — c. square feet | d. square feet | e. square | f. square feet

Sq feet between 100-200 feet — g. square feet | h. square feet | i. square | j. square feet

C. General Conditions Under Massachusetts Wetlands Protection Act

Brief Project Description: The removal of the Department of Public Works Materials Handling Area and regrading of that area to accommodate a potential future solar photovoltaic array.

(only applicable to approved projects)

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.

2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.

3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.

4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
   a. the work is a maintenance dredging project as provided for in the Act; or
   b. the time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.

5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order.

6. If this Order constitutes an Amended Superseding Order of Conditions, this Amended Superseding Order of Conditions does not extend the issuance date of the original Final Order of Conditions and the Superseding Order will expire on April 17, 2024 unless extended in writing by the Department.

7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.

8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.

9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Department on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work.

10. A sign shall be displayed at the site not less then two square feet or more than three square feet in size bearing the words,
    "Massachusetts Department of Environmental Protection" [or, "MA DEP"]
    "File Number 090-1281 "

11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before DEP.

12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Department of Environmental Protection.

13. The work shall conform to the plans and special conditions referenced in this order.

14. Any change to the plans identified in Condition #13 above shall require the applicant to inquire of the Department in writing whether the change is significant enough to require the filing of a new Notice of Intent.

15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.

16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.

17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Department.

18. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Department, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.

NOTICE OF STORMWATER CONTROL AND MAINTENANCE REQUIREMENTS

19. **The work associated with this Order (the "Project") is** (1) ☒ **is not** (2) ☐ **subject to the Massachusetts Stormwater Standards. If the work is subject to the Stormwater Standards, then the project is subject to the following conditions:**

a) All work, including site preparation, land disturbance, construction, and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Construction General Permit as required by Stormwater Condition 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.

C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that:
i. all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures;
ii. as-built final construction BMP plans are included signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized;
iii. any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10;
iv. all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition;
v. any vegetation associated with post-construction BMPs is suitably established to withstand erosion.

c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 19(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement) for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMPs Operation and Maintenance Plan ("O&M Plan") and certifying the following: *i.*) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and *ii.*) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.

d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Multi-Sector General Permit.

e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, and acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 19(f) through 19(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 19(f) through 19(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.

f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.

C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

g) The responsible party shall:
   1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
   2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
   3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.

h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.

i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.

j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.

k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.

l) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

Special Conditions (See attached sheet(s) or below for additional Special Conditions numbered 20 - 21.

20) All Special Conditions included in the Superseding Order of Conditions for this project shall remain in full force and effect under the Amended Superseding Order of Conditions.

21) The following plans, modified November 2022, shall be substituted for the plans referenced in the Superseding Order of Conditions.

- G-1 Index Sheet
- G-3 Overall Site Key Plan
- G-14 Final Grading and Drainage Plan (Sheet 1 of 4)
- G-15 Final Grading and Drainage Plan (Sheet 2 of 4)
- G-16 Final Grading and Drainage Plan (Sheet 3 of 4)
- G-17 Final Grading and Drainage Plan (Sheet 4 of 4)

D. Findings Under Municipal Wetlands Bylaw or Ordinance

To the extent that the Order is based on a municipal bylaw or ordinance, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no jurisdiction to supersede the local by-law order.

E. Issuance

This Order is valid for three years from the date of issuance, unless otherwise specified as a special condition pursuant to General Conditions # 4 or # 6.

Issued by: **Massachusetts Department of Environmental Protection:**

Northeast
MassDEP Regional Office

Section Chief - NERO Signature

March 21, 2023
Date

Jill Provencal
Section Chief - NERO Printed Name

This Order is issued to the applicant as follows:

☐ by Hand delivery on

Date

☒ by certified mail on:

March 21, 2023
Date

F. Appeal Rights and Time Limits

The applicant, the landowner, the conservation commission, any person aggrieved by the Superseding Order, Determination or other Reviewable Decision as defined at 310 CMR 10.04, who previously participated in the proceedings leading to this Reviewable Decision, the conservation commission, or any ten (10) residents of the city or town where the land is located if at least one resident was previously a participant in the permit proceeding, are hereby notified of their right to appeal this Reviewable Decision pursuant to M.G.L. c.30A, § 10, provided the request is made by certified mail or hand delivery to the Department, along with the appropriate filing fee and a MassDEP Fee Transmittal Form within ten (10) business days of the date of issuance of this Superseding Order or Determination, and addressed to:

Case Administrator
Office of Appeals and Dispute Resolution
Massachusetts Department of Environmental Protection
100 Cambridge Street, Suite 900
Boston, MA 02114

A copy of the request (hereinafter also referred to as Appeal Notice) shall at the same time be sent by certified mail or hand delivery to the Conservation Commission, the applicant, the person that requested the Superseding Order or Determination, and the issuing office of the MassDEP at:

MassDEP – Northeast Region
Wetlands Program
150 Presidential Way, Suite 300
Woburn, MA 01801

In the event that a ten-resident group requested the Superseding Order or Determination, the Appeal Notice shall be served on the designated representative of the ten-resident group, whose name and contact information is included in this Reviewable Decision (when relevant).

Contents of Appeal Notice

An Appeal Notice shall comply with the Department's Rules for Adjudicatory Proceedings, 310 CMR 1.01(6) and 310 CMR 10.05(7)(j), and shall contain the following information:

a) the MassDEP Wetlands File Number, name of the applicant, landowner if different from applicant, and address of the project;

b) the complete name, mailing address, email address, and fax and telephone numbers of the party filing the Appeal Notice; if represented by consultant or counsel, the name, fax and telephone numbers, email address, and mailing address of the representative; if a ten-resident group, the same information for the group's designated representative;

c) if the Appeal Notice is filed by a ten (10) resident group, then a demonstration of participation by at least one resident in the previous proceedings that led to this Reviewable Decision;

d) if the Appeal Notice is filed by an aggrieved person, then a demonstration of participation in the previous proceeding that led to this Reviewable Decision and sufficient written facts to demonstrate status as a person aggrieved;

e) the names, telephone and fax numbers, email addresses, and mailing addresses of all other interested parties, if known;

f) a clear and concise statement of the alleged errors contained in the Department's decision and how each alleged error in inconsistent with 310 CMR 10.00 and does not contribute to the protection of the interests identified in the Wetlands Protection Act, M.G.L. c.131, § 40, including reference to the statutory or regulatory provisions that the party filing the Appeal Notice alleges has been violated by the Department's Decision, and the relief sought, including any specific desired changes to the Department's decision;

g) a copy of the Department's Reviewable Decision that is being appealed and a copy of the underlying Conservation Commission decision if the Reviewable Decision affirms the Conservation Commission decision;

h) a statement that a copy of the request has been sent by certified mail or hand delivery to the applicant and the conservation commission; and

i) if asserting a matter that is Major and Complex, as defined at 310 CMR 10.04(1), a statement requesting that the Presiding Officer make a designation of Major and Complex, with specific reasons supporting the request.

Filing Fee and Address

A copy of the Appeal Notice along with a MassDEP Fee Transmittal Form and a valid check or money order payable to the Commonwealth of Massachusetts in the amount of one hundred dollars ($100) must be mailed to:

Commonwealth of Massachusetts
Department of Environmental Protection
Commonwealth Master Lockbox
P.O. Box 4062
Boston, Massachusetts 02211

The request will be dismissed if the filing fee is not paid unless the appellant is exempt or granted a waiver. The filing fee is not required if the appellant is a city or town (or municipal agency), county, district of the Commonwealth of Massachusetts, or a municipal housing authority. The Department may waive the adjudicatory hearing filing fee pursuant to 310 CMR 4.06(2) for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file an affidavit setting forth the facts believed to support the claim of undue financial hardship together with the hearing request as provided above.

Massachusetts Department of Environmental Protection
Bureau of Water Resources – Wetlands Program
Amended Superseding Order of Conditions
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

MassDEP File #

090-1281

This Superseding Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Department.

To: Massachusetts Department of Environmental Protection Northeast Regional Office
Issuing Authority

150 Presidential Way, Suite 300, Woburn, MA 01801
MassDEP Regional Office Address

Please be advised that the Order of Conditions for the Project at:

10 Ledge Road, Andover
Project Location (Street and Town)

090-1281
MassDEP File Number

Has been recorded at the Registry of Deeds of:

Essex North
County

Book

Page

For:
Property Owner

and has been noted in the chain of title of the affected property in:

Book

Page

In accordance with the Order of Conditions issued on:

Date

If recorded land, the instrument number identifying this transaction is:

Instrument Number

If registered land, the document number identifying this transaction is:

Document Number

Signature of Applicant

MassDEP
Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Northeast Regional Office • 150 Presidential Way Woburn, MA 01801 • 978-694-3200

Maura T. Healey
Governor

Kimberley Driscoll
Lieutenant Governor

Rebecca L. Tepper
Secretary

Gary Moran
Acting Commissioner

Mr. Chris Cronin
Department of Municipal Services
Town of Andover
5 Campanelli Drive
Andover, MA. 01810

March 21, 2023

Application for: **WATER QUALITY CERTIFICATION - Amendment #1**
Application for: **BRP WW 10**, Water Quality Certification
Major Project- Landfill Closure, Arsenic- Impacted Soils Removal and DPW Materials Handling area Reconstruction

At: Ledge Road Landfill- 10 Ledge Road, Andover, Massachusetts: DEP Transmittal **#X272333** DEP WETLANDS FILE **#90-1281** United States Army Corps of Engineer (USACE) File Number: NAE-2016-02013

Dear Mr. Cronin:

The Northeast Regional Office Massachusetts Department of Environmental Protection, Wetlands Program (MassDEP) is in receipt of your letter requesting an Amendment to the Water Quality Certification (WQC) issued on May 15, 2018.

The original 401 WQC approved implementation of a Corrective Action Alternative (CAA) as approved under MassDEP's Solid Waste Management Regulations. The activities approved included: capping and closure of the former 26-acre landfill including a synthetic impermeable liner, installation of passive landfill gas controls, and a new stormwater management system; and removal of arsenic impacted soils from downgradient Bordering Vegetated Wetlands (BVW), with impacted wetlands restored in-kind.

The Amendment request is being made to remove the previously proposed post closure use for the landfill site as a Department of Public Works (DPW)Materials Handling Area. The amendment request does not propose a post closure use. Consistent with the original 401 WQC application), a potential future solar photovoltaic (PV) array is considered the preferred post closure use, and therefore 5.5 acres of the site will be graded to maximize the potential for a

This information is available in alternate format. Please contact Melixza Esenyie at 617-626-1282.
TTY# MassRelay Service 1-800-439-2370
MassDEP Website: www.mass.gov/dep

Printed on Recycled Paper

future solar array. The revised stormwater design takes this future use into account, as did the design in the original 401 WQC.

The changes proposed include revised final grading with 5% (20:1) slope on top of the capped landfill, to be seeded with a naturalized area seed mixture and maintained as a grassy field. The Stormwater Report has been updated to take into account the elimination of the DPW Materials Handling Area. To continue to take into account a possible future solar array, the sizing of the detention basins was not modified. 5.5 acres of the site will be graded to maximize the potential for a future solar array. With the elimination of the DPW Materials Handling Area, new impervious cover has been revised downward to 0.18 acre from the previously approved 6 acres. All previously approved amounts of impacts to resource areas remain the same.

MassDEP finds that the plan changes results in a project configuration that lessens the proposed impervious areas, resulting in decreased stormwater runoff and that impacts to other resource areas remain the same as compared to the plan allowed by the SOC.

MassDEP is therefore issuing this amendment approving the revised plan sheets. In all other respects, the conditions of the original 401WQC are unchanged. This amendment does not change the effective date of issuance of the 401WQC.

In accordance with 314 CMR 9.00, there is reasonable assurance the project or activity will be conducted in a manner which will not violate applicable water quality standards (314 CMR 4.00) and other applicable requirements of state law. MassDEP has determined that upon satisfying the conditions and mitigation requirements of this approval, the project provides a level of water quality necessary to protect existing uses and accordingly finds that the project to be implemented satisfies the Surface Water Quality Standards at 314 CMR 4.00. Therefore, based on information currently in the record, MassDEP grants a 401 WQC Amendment for this project subject to the following conditions to maintain water quality, to minimize impact on waters and wetlands, and to ensure compliance with appropriate state law.

All work shall be performed in accordance with the following plan changes:
"Ledge Road Landfill Closure Project, Town of Andover, Massachusetts, 100% Corrective Action Design Submittal."

The following plans, modified 11/2022, shall be substituted for the plans referenced in the original 401 WQC:

- G-1 index Sheet
- G-3 Overall Site Key Plan
- C-14 Final Grading and Drainage Plan (Sheet 1 of 4)
- C-15 Final Grading and Drainage Plan (Sheet 2 of 4)
- C-16 Final Grading and Drainage Plan (Sheet 3 of 4)
- C-17 Final Grading and Drainage Plan (Sheet 4 of 4)

Prepared by CDM revised November 1, 2022, Stamped and signed by Nathan Jones, PE

On File With: MassDEP, the Andover Conservation Commission and the USACE.

NOTE: All other conditions of the May 15, 2018 401 WQC remain in full force and effect.

Section 61 Findings: Pursuant to M.G.L. Chapter 30, Sections 61 to 62H (M.E.P.A.) this project was reviewed as EOEA No. 13514. The original ENF was filed in April of 2006 and the Secretary's Certificate issued on May 23, 2005 found that no Environmental Impact Report (EIR) was required. The ENF for the currently proposed configuration of the project was filed on September 1, 2016. The Secretary's Certificate issued on November 4, 2016 found that the ENF sufficiently defined the nature and general elements of the project for the purpose of MEPA review and that no further MEPA review was required.

Failure to comply with this certification is grounds for enforcement, including civil and criminal penalties, under MGL c.21 §42, MGL c.21A §16, or other possible actions/penalties as authorized by the General Laws of the Commonwealth. This Certification does not relieve the applicant of the obligation to comply with other appropriate state or federal statutes or regulations. This includes, but is not limited to, the conditions of the U.S. Department of the Army Programmatic General Permit, Commonwealth of Massachusetts. No activity may commence on any portion of the project site subject to the jurisdiction of the 401 Water Quality Certification Regulations until MassDEP issues such Certification and all appeal periods have elapsed.

Failure to comply with this certification is grounds for enforcement, including civil and criminal penalties, under MGL c.21 §42, MGL c.21A §16, or other possible actions/penalties as authorized by the General Laws of the Commonwealth.

Should you have any questions, please contact Mr. Phil DiPietro at philip.dipietro@mass.gov.

Sincerely,

Jill Provencal
Section Chief
Wetlands Program-NERO

cc MassDEP, BAW, NERO
Conservation Commission, Andover
USACOE, 696 Virginia Road, Concord, MA. 0172-2751
Mr. Jose Albuquerque, 197 Greenwood Road, Andover, MA. 01860

Notice of Appeal rights

A) Appeal Rights and Time Limits

Certain persons shall have a right to request an adjudicatory hearing concerning certifications by MassDEP when an application is required: (a) the applicant or property owner; (b) any person aggrieved by the decision who has submitted written comments during the public comment period; any ten (10) persons of the Commonwealth pursuant to M.G.L. c. 30A where a group member has submitted written comments during the public comment period; or (c) any governmental body or private organization with a mandate to protect the environment which has submitted written comments during the public comment period. Any person aggrieved, any ten (10) persons of the Commonwealth, or a governmental body or private organization with a mandate to protect the environment may appeal without having submitted written comments during the public comment period only when the claim is based on new substantive issues arising from material changes to the scope or impact of the activity and not apparent at the time of public notice. To request an adjudicatory hearing pursuant to M.G.L. chapter 30A section 10, a Notice of Claim must be made in writing provided that the request is made by certified mail or hand delivery to MassDEP, with the appropriate filing fee specified within 310 CMR 4.10 along with a DEP Fee Transmittal Form within twenty-one (21) days from the date of issuance of this Certificate, and addressed to:

Docket Clerk
Office of Administrative Appeals
Department of Environmental Protection
One Winter Street, 3rd Floor
Boston, MA 02108

A copy of the request shall at the same time be sent by certified mail or hand delivery to the issuing office of the Wetlands and Waterways Program at:

Department of Environmental Protection, Northeast Regional Office
150 Presidential Way
Woburn, MA 01801

B) Contents of Hearing Request

A Notice of Claim for Adjudicatory Hearing shall comply with the Department's Rules for Adjudicatory Proceedings, 310 CMR 1.01 (6), and shall contain the following information pursuant to 314 CMR 9.10(3):

(a) the 401 Certification Transmittal Number and DEP Wetlands Protection Act File Number;
(b) the complete name of the applicant and address of the project;
(c) the complete name, address, and fax and telephone numbers of the party filing the request, and, if represented by counsel or other representative, the name, fax, and telephone number of the attorney;
(d) if claiming to be a party aggrieved, the specific facts that demonstrate that the party satisfies the definition of "aggrieved person" found at 314 CMR 9.02;

(e) a clear and concise statement that an adjudicatory hearing is being requested;
(f) a clear and concise statement of (1) the facts which are grounds for the proceedings, (2) the objections to the Certificate, including specifically the manner in which it is alleged to be inconsistent with the Department's Water Quality Regulations, 314 CMR 9.00, and (3) the relief sought through the adjudicatory hearing, including specifically the changes desired in the final written Certification, and
(g) a statement that a copy of the request has been sent by certified mail or hand delivery to the applicant, the owner (if different from the applicant), the conservation commission of the city or town where the activity will occur, the Department of Environmental Management (when the certificate concerns projects in Areas of Critical Environmental Concern), the public or private water supplier where the project is located (when the certificate concerns projects in Outstanding Resource Waters), and any other entity with responsibility for the resource where the project is located.

C) Filing Fee and Address

The hearing request along with a DEP Fee Transmittal Form and a valid check or money order payable to the Commonwealth of Massachusetts in the amount of one hundred dollars ($100) must be mailed to:

Commonwealth of Massachusetts
Department of Environmental Protection
Commonwealth Master Lockbox
P.O. Box 4062
Boston, MA 02211

The request will be dismissed if the filing fee is not paid, unless the applicant is exempt or granted a waiver. The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal housing authority. MassDEP may waive the adjudicatory hearing filing fee pursuant to 310 CMR 4.06 (2) for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file an affidavit setting forth the facts believed to support the claim of undue financial hardship together with the hearing request as provided above.

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

November 19, 2019

Regulatory Division
File Number: NAE-2016-02013

Mr. Marc Fournier
Department of Municipal Services
Town of Andover
397 Lowell Street
Andover, Massachusetts 01810

Dear Mr. Fournier:

This is in response to your request dated November 8, 2019, to modify a project that is authorized under the Massachusetts General Permits (GPs). Specifically, you have requested that we modify special condition #1 of our Department of the Army verification letter, file number NAE-2016-02013 and dated November 14, 2018, which authorized filling waters of the United States in order to cap the former municipal Ledge Road Landfill and removing arsenic impacted soils from wetlands and an intermittent stream. Special condition # 1 is hereby revised as follows:

1. In order to compensate for the permanently filled wetlands, the permittee shall perform either (a) or (b) below:

a. Execute and record a conservation easement to protect the land shown on the plan titled, "LAND PRESERVATION PLAN LEDGE ROAD LANDFILL CLOSURE, TOWN OF ANDOVER, MA," on one sheet, and dated "FEBRUARY 2018," in perpetuity. The conservation easement and plan were enclosed with the November 14, 2018 verification letter. The conservation easement encompasses 395,000 SF of uplands and 269,000 SF of wetlands. A copy of the executed and recorded document must be sent to: "PATS Branch - Regulatory Division, Corps of Engineers, New England District, 696 Virginia Road, Concord, MA 01742-2751" within 120 days of this letter, but no later than 10 days after the date of the recording. Documents which are not addressed in this manner may not reach their intended destination and do not comply with the requirements of this permit.

b. Provide compensatory mitigation in the form of a payment of $73,004 to the Massachusetts In-Lieu Fee (ILF) program within 120 days of this letter. The permittee must send a cashier's check or bank draft to: Brian Kelter, CFO, Department of Fish and Game, 251 Causeway Street, Suite 400, Boston, MA 02114. The check shall be made out to "Commonwealth of Massachusetts, Department of Fish and Game Environmental Mitigation Expendable Trust" and include the Corps file number and the statement: "For ILF account only". The check must be accompanied by the enclosed "Massachusetts In-lieu Fee Project Impact Worksheet" to ensure proper crediting. This is to secure .117528 credits for the permanent fill of 10,239 square feet of palustrine forested wetlands. **Work may not begin until the Corps has received a copy of the MADFG letter acknowledging sale of credits.**

All other terms and conditions of the original verification letter remain in full force and effect.

We continually strive to improve our customer service. In order for us to better serve you, please complete our Customer Service Survey located at http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey.

If you have any questions, please contact Greg Penta, of my staff at (978) 318-8862.

Sincerely,

NEWMAN.BARBARA.H.1261008927 Digitally signed by NEWMAN.BARBARA.H.1261008927 Date: 2019.11.19 17:04:27 -05'00'

Barbara Newman
Chief, Permits and Enforcement Branch
Regulatory Division

Enclosure

cc:

Ed Reiner, U.S. EPA, Region 1, Boston, Massachusetts; reiner.ed@epa.gov
Phil DiPietro, DEP NERO, Wetland and Waterways, Wilmington, Massachusetts; philip.dipietro@state.ma.us
Brian Kelter, CFO, Department of Fish and Game; brian.kelter@state.ma.us
Aisling O'Shea, In-Lieu Fee Program Administrator; Department of Fish and Game; aisling.o'shea@state.ma.us
Andover Conservation Commission, 36 Bartlet Street, Andover, Massachusetts 01810
Nathan Jones, CDM Smith Inc., 75 State Street, Suite 701, Boston Massachusetts 02109; jonesNE@cdmsmith.com

MASSACHUSETTS IN-LIEU FEE (ILF) PROJECT IMPACT WORKSHEET

Corps file number:	NAE-2016-02013
Date permit issued:	
Corps project manager:	Greg Penta
Permittee(s):	Marc Fournier, Department of Municipal Services, Town of Andover
Project location/address/Lat/Long (from ORM Location page):	42.671455; -71.191105 10 Ledge Road, Andover, MA
8-digit hydrologic unit code:	01070006
Service area from ILF interactive statewide map (include subarea):	north coastal
Service area rate/square foot or LF:	$14.26
Area subject to compensation:	5119.5 SF
Total Compensation:	$ 73004.07
Number of credits to be purchased from spreadsheet :	
Wetlands:	0.117528
Stream:	0

Comments:
Charging 50% of the in-lieu fee payment since this a project to cap a landfill and cleanup hazardous and toxic waste from the wetlands.

Wetlands and Aquatic Resource Impacts								
Resource Type List all that apply Cowardin	Latitude °N	Longitude °E	SF of Impacts to Aquatic Resources Impacted SF	% of the Standard Amount %	SF of Impacts to Aquatic Resources Subject to Compensation SF	Credit Cost Per SF $ per/SF	Total Compensation Required $	Credits
PFO	42.67074	-71.19287	301	50	150.5	14.26	2146.13	0.003455
PFO	42.67074	-71.19287	1522	50	761	14.26	10851.86	0.01747
PFO	42.67074	-71.19287	1522	50	761	14.26	10851.86	0.01747
PFO	42.67074	-71.19287	304	50	152	14.26	2167.52	0.003489
PFO	42.67074	-71.19287	6590	50	3295	14.26	46986.7	0.075643
				Total	5119.5		73004.07	0.117528

Use this table for Wetlands and Aquatic Resource Impacts

Use the Aqutic Resources Tab from ORM to populate this table

Jones, Nathan E.

From: Goulet, Keith A CIV USARMY CENAE (USA) <Keith.A.Goulet@usace.army.mil>
Sent: Thursday, April 20, 2023 2:00 PM
To: Jones, Nathan E.
Cc: Maniccia, Paul M CIV USARMY CENAE (USA)
Subject: Project modification for the Ledge Road Landfill Project

You don't often get email from keith.a.goulet@usace.army.mil. Learn why this is important

Hi Nathan,

After review of the information that you sent. The change in the plan to remove the DPW Materials Handling Area and instead grade the area and construct a traditional landfill cap with a mowed grass surface will result in no net increase in impact as well as no change in the foot print of the already permitted project. Therefor no modification to permit NAE-2016-02013 is necessary.

Sincerely,

Keith Goulet
Project Manager
NAE-Regulatory Division
Keith.A.Goulet@usace.army.mil
☎978-318-8296

Peterson, Chandler R.

From: Spieler, Richard (DEP) <richard.spieler@mass.gov>
Sent: Thursday, May 22, 2025 10:40 AM
To: Jones, Nathan E.
Cc: Peterson, Chandler R.; Carlos Jaquez; Fairbrother, Mark (DEP)
Subject: FW: Ledge Road Landfill Closure (Approval SW11AC-0000027) - Proposed Change
Attachments: Sheet C-24 - Proposed Modification 2025.05.19.pdf; Sheet D-2.pdf; Sheet D-7 - Proposed Modification 2025.05.19.pdf

Nathan: The proposed additional work associated with the extension of the horizontal gas collection trench would be considered minor in nature and is hereby approved.

Please document this change in the Construction Certification report for the project required by Mas DEP's approval dated May 16, 2023 (Authorization Number: SW11AC-0000027).

Please provide a 48-hour notice and project schedule prior to commencing work pursuant to this approval.

Any questions, please call.

Richard J. Spieler
Mass DEP
BWP-Solid Waste Section
150 Presidential Way, Suite 300
Woburn, MA 01801
Office: 781-697-6730
Cell: 978-914-3643

From: Jones, Nathan E. <JonesNE@cdmsmith.com>
Sent: Wednesday, May 21, 2025 10:03 AM
To: Spieler, Richard (DEP) <richard.spieler@mass.gov>
Cc: Fairbrother, Mark (DEP) <mark.fairbrother@mass.gov>; Carlos Jaquez <carlos.jaquez@andoverma.us>; Peterson, Chandler R. <petersoncr@cdmsmith.com>
Subject: RE: Ledge Road Landfill Closure (Approval SW11AC-0000027) - Proposed Change

CAUTION: This email originated from a sender outside of the Commonwealth of Massachusetts mail system. Do not click on links or open attachments unless you recognize the sender and know the content is safe.

Hi Rick,

Based on our conversation on Monday, I am providing the following additional information to support this request for approval for a modification to the landfill gas control system.

- The extension of the horizontal gas collection trench will include two vent risers spaced approximately 100 feet apart per Detail 3 on Sheet D-7. These have been added to the marked-up Sheet C-24 (attached). The vent risers will be located approximately 25 feet from each end of the proposed vent trench extension (note

that the length of the proposed vent trench is approximately 150 feet, not 180 feet as mistakenly indicated below).

- So as not to disturb the completed landfill cap, the new section of horizontal gas collection trench will be located outside the constructed cap at the location of the current anchor trench. Note that the portion of the anchor trench where the vent trench will be constructed (between the double-lined wetland basin and Greenwood Road) is flat and therefore does not include the riprap toe drain shown on Detail 4 on Sheet D-2. The attached markup of Detail 3 on Sheet D-7 shows how the vent trench will be constructed. Sheet D-2 is also provided for reference. The trench will be excavated through the existing anchor trench, allowing the horizontal portion of FML in the anchor trench to fall vertical. New FML will be installed outside and over the new vent trench and will overlap the cap by approximately 1-foot. This new piece of FML will be extrusion welded to the top of the existing cap.
- Soil excavated from the vent trench will be placed on the former Ledge Road, covered with 4-in topsoil, and hydroseeded.

Please let me know if you have any questions. The Town has approved moving forward with this change, and Bates is ready to construct once approval from MassDEP is received. The goal is to complete the work including site restoration and hydroseeding of disturbed areas by June 15th.

Thanks
Nathan

From: Jones, Nathan E.
Sent: Monday, May 19, 2025 11:34 AM
To: Spieler, Richard (DEP) <richard.spieler@mass.gov>
Cc: Fairbrother, Mark (DEP) <mark.fairbrother@mass.gov>; Carlos Jaquez <carlos.jaquez@andoverma.us>; Peterson, Chandler R. <petersoncr@cdmsmith.com>
Subject: Ledge Road Landfill Closure (Approval SW11AC-0000027) - Proposed Change

Hi Rick,

As discussed, to address exceedances of 25% of the Lower Explosive Limit in new landfill gas monitoring well LFG-9 following construction of the landfill cap and landfill gas control systems at the Ledge Road Landfill during the December 2024 and March 2025 monitoring rounds, the Town proposes the following modification to the approved landfill gas management system:

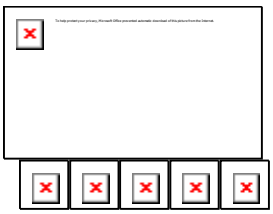
- The horizontal gas collection trench along the southern property boundary will be extended approximately 180 feet along the constructed anchor trench east of the double-lined wetland basin, between the basin and Greenwood Road, to new landfill gas monitoring well LFG-10, where landfill gas has not been detected. The approximate alignment of the proposed horizontal gas collection trench extension is shown on the attached marked up Sheet C-24 – Environmental Monitoring Network and Landfill Gas Management System Layout. The horizontal gas collection trench extension will be constructed per the approved Detail 3 on Sheet D-7.

Please review and provide approval for the above change. Let me know if you have any questions.

Thanks
Nathan

Nathan E. Jones, PE, PMP
Environmental Engineer | Project Manager
CDM Smith
75 State Street, Boston, MA 02109
Office: 617.452.6563

Mobile: 617.460.4374
jonesne@cdmsmith.com
cdmsmith.com



CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN

LEDGE ROAD LANDFILL CLOSURE
ANDOVER, MASSACHUSETTS

Prepared For:

J. BATES AND SON, LLC
P.O. BOX 997
CLINTON, MASSACHUSETTS 01510

Prepared By:

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
31 BELLOWS ROAD
RAYNHAM, MASSACHUSETTS 02767

CEC Project 334-409

AUGUST 2023

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PLAN CERTIFICATION

It is the policy of J. Bates & Son, LLC (J. Bates) to conduct the construction at Ledge Road Landfill in Andover, Massachusetts in a manner, which protects the health and safety of its employees, the public and surrounding environment. To this end, this Construction Stormwater Pollution Prevention Plan (CSWPPP) has been implemented.

As required under Appendix G.11.4 of the NPDES General Permit for Stormwater from Construction Activities (CGP), the following certification is made:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature	Title
Name	Date

Signatory Authority:

For a corporation: a responsible corporate officer. A responsible corporate officer may include a president, secretary, treasurer, or vice president in charge of a principal business function, or any other manager of one or more operating facilities authorized to make management decisions.

1.0 INTRODUCTION

1.1 BACKGROUND

This Construction Storm Water Pollution Prevention Plan (CSWPPP) has been prepared by Civil & Environmental Consultants, Inc. (CEC) on behalf of J. Bates and Son, LLC (J. Bates) for the construction of the closure system at the Ledge Road Landfill (Landfill), located in Andover, Massachusetts.

As required by the 1987 amendments to the Clean Water Act, in November 1990 the U.S. Environmental Protection Agency (EPA) initiated the National Pollutant Discharge Elimination System (NPDES) stormwater permitting program. Under this program, NPDES permits are required for all stormwater discharges associated with industrial activity.

To provide flexibility for the regulated community, EPA includes two permit options: 1) an individual application/permit, or 2) a Notice of Intent (NOI) for a general permit. The 2022 NPDES General Permit for Stormwater Discharges from Construction Activities (Construction General Permit, or CGP) became effective on February 17, 2022, replacing the 2017 CGP.

The goal of the CGP is to reduce or eliminate stormwater pollution from construction activity. The EPA requires the preparation of a CSWPPP prior to filing an NOI for construction activities. The CSWPPP focuses on two major objectives: 1) to identify sources of pollution potentially affecting stormwater quality, and 2) to ensure implementation of measures to minimize and control those potential pollutants.

1.2 APPLICABILITY

J. Bates will be performing landfill closure activities at the Landfill. The site includes approximately 23 acres of former municipal landfill that was closed in 1972 and downgradient wetland resource areas that have been impacted by landfill leachate. The project will include removal of the arsenic and iron contaminated wetland soils in conjunction with the capping of the

Ledge Road Landfill. The project also includes improvements to the Greenwood Road drainage system. This will include the installation of new deep-sump catch basins, installation of an in-line separator, and installation of new 18-inch outfall piping within the drainage easement. Additionally, a new outlet will replace the existing failed outfall piping system with an existing outfall on private property.

Therefore, J. Bates has submitted a Notice Of Intent (NOI) to the EPA in order to obtain coverage under the CGP for storm water discharges associated with landfill closure activities at the Ledge Road Landfill. The NOI is included in Appendix A.

1.3 SWPPP MODIFICATIONS

The CGP, Part 7.4, requires the CSWPPP to be amended whenever: there is a change in design, construction, operation or maintenance which is no longer accurately reflected in the CSWPPP; or inspections or investigations by site operator, local, state or federal officials indicate the CSWPPP to be ineffective in eliminating or significantly minimizing pollutants from sources identified, or otherwise not achieving the general objectives of controlling pollutants in the construction site's storm water discharges.

1.4 SITE AND ACTIVITY DESCRIPTION

The work is located at the former municipal Ledge Road Landfill located off Chandler Road and Greenwood Road in the Town of Andover, Massachusetts, and in adjacent wetland areas located immediately west of the landfill.

This site includes an approximate 23-acre former municipal landfill that was closed in 1972 and downgradient wetland resource areas that have been impacted by the landfill. The landfill property and downgradient wetland resource areas on which work is to be conducted are owned by the Town of Andover. In addition, there is a Town owned stormwater drainage easement on private property just south of the landfill which will serve as a temporary construction easement during the closure project. Residential properties abut the landfill to the south along Pettingell Avenue

and to the Northwest (Chandler Road), northeast (Chandler Road), and southeast (Greenwood Road).

The latitude and longitude (as noted in the Amended Order of Conditions) of the landfill are:

Latitude: 42° 67' 14” Longitude: -71° 19' 12”

1.5 OPERATOR AND STORMWATER POLLUTION PREVENTION TEAM

The operator of the construction site will be J. Bates. J. Bates will have control over the entire project area and will be responsible for overseeing the development of this CSWPPP, any later modifications to it, and for compliance with the requirements of the CGP. Construction activities will be carried out by J. Bates under the supervision of the property owner, the Town of Andover.

The on-site contractor, ___J. Bates & Son LLC____ of _____Clinton, MA_____, is responsible for supervising and implementing good housekeeping programs, conducting routine site inspections to ensure proper functionality of all best management practices (BMPs), documenting any changes to this CSWPPP in response to changing conditions on-site, and communicating those changes to on-site personnel. The following individuals are part of the site storm water pollution prevention team and are responsible for installing and maintaining structural storm water controls under the supervision of the above-mentioned contractor:

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

1.6 PROJECT FUNCTION

This CSWPPP addresses the excavation/relocation of contaminated wetlands soils and construction of a landfill closure system. The contaminated soils will be relocated to the landfill prior to final capping, as based on the design drawings completed by CDM Smith, dated March 2023.

The purpose of the removal of the contaminated wetland soils in conjunction with the closure of the Ledge Road Landfill is to remove the arsenic and iron from the wetlands; which became contaminated from the Ledge Road Landfill, and to prevent the contamination from reoccurring by capping of the landfill. The soils and landfill closure work will be performed in accordance with the Massachusetts Department of Environmental Protection (MassDEP) Solid Waste Management Regulations (310 CMR 19.000) and all federal, state, and local permit approvals.

1.7 NATURE OF MAJOR CONSTRUCTION ACTIVITIES

In general, the construction will include the following general tasks:

1. Mobilization.
2. Locate and stake the limits of the drainage easement, location of erosion controls, and wetland soil removal areas.
3. Site preparation including sediment and erosion controls, temporary construction fence, clearing and grubbing, grading, and waste consolidation.
4. Removal/relocation of contaminated soils and associated wetland restoration.
5. Abandon existing utility infrastructure and underdrain system.
6. Remove all above ground features and foundations within project limits and dispose off site.
7. Complete initial shaping and grading of landfill to proposed cap subgrade contours.
8. In general, construct the landfill cap including installation of gas venting sand, a 40-mil thick flexible membrane liner, sub-drain piping, a drainage sand layer, a topsoil layer which will be seeded and have erosion control blanket on slopes steeper than 4H:1V, and all related appurtenances. Other areas of the Landfill cap will consist of a

gravel road cap section, which will have the materials placed above the 40-mil thick flexible membrane liner.

9. Construct stormwater detention basins including double lined detention basin/wetlands and grass and riprap lined drainage swales.
10. Construct permanent gravel access roads.
11. Install passive landfill gas management system including passive landfill gas vents and horizontal passive gas collector trenches.
12. Conduct wetland restoration, replication, and mitigation measures.
13. Install groundwater monitoring wells.
14. Perform final site cleanup and demobilization.

All Work shall comply with the requirements of the Administrative Consent Order dated November 29, 2022, the MassDEP Conditional Approval of the Corrective Action Design, and all wetland permits obtained for the project, which include the Town of Andover Order of Conditions, MassDEP Superseding Order of Conditions, U.S. Army Corp of Engineers General Permit (GP) 8 and supplemental conditions, and MassDEP 401 Water Quality Certificate.

Additional sediment and erosion controls may be employed during site construction activities, which may include soil stabilization by planting vegetation, or placing mulch and diversion berms up-hill from construction areas to direct run-off away from the construction area.

In accordance with the CGP, each storm water control measure mentioned above will be installed in entirety before each phase of upgradient earth-disturbance begins, unless infeasible.

1.8 SITE AREA

The soil excavation and material relocation activities will take place over approximately 23 acres of the former municipal landfill that was closed in 1972, and also downgradient wetland resource areas that have been impacted by the landfill.

Figure 1, Site Locus Map, shows all waters of the United States as shown on USGS maps within one mile of the site boundary. Figures 2 through 9 contain the erosion and sediment control and

site plans, which includes the location of the erosion controls and proposed stormwater management system. Storm water run-off from the active construction site will drain into temporary and permanent storm water management basins, and then discharge into the adjacent wetlands via an outlet control structure.

1.9 OTHER NPDES DISCHARGES

There are currently no activities and associated discharges covered under the NPDES Storm Water Multi-Sector General Permit for Industrial Activities.

1.10 POTENTIAL POLLUTANTS

Potential pollutant sources from the construction site are primarily sediment and total suspended solids (TSS) generated from excavation and stockpiling activities. Equipment utilized in the construction operation use materials such as diesel fuel, motor oil, transmission oil, and grease for construction equipment operation and maintenance. There is minimal potential for this fuel to come into contact with storm water during fueling operations. Motor oil, transmission oil, and grease are stored in the company lube truck. There is minimal potential for contact with storm water during the maintenance of this equipment. Used motor oil from the equipment at the Facility is collected in the lube truck and transported off-site. Miscellaneous heavy equipment is stored/parked on the packed gravel area adjacent to the construction activity. This area will be inspected on a weekly basis to ensure incidental spills are cleaned up to reduce the potential for contact with storm water. Additionally, spill kits are present at the site, if needed, at strategic locations in close proximity to equipment storage areas.

No additional construction equipment will be stored on the site. Although minor, construction debris may be exposed to precipitation.

2.0 STORMWATER CONTROLS

This section describes the types and locations of existing structural and non-structural best management practices (BMPs) to be implemented where construction materials or activities are exposed to stormwater. The stormwater management improvements and controls will attenuate runoff discharge peaks, minimize erosion, enhance stormwater infiltration, minimize the transport of sediments, improve water quality, and prevent impacts to adjacent wetlands.

2.1 POLLUTION CONTROL MEASURES

Storm water from the Landfill slopes will be collected by the perimeter swales and other collection features which surround the Landfill and direct runoff to on-site storm water detention basins. Rip-rap will continue to be used as needed to provide velocity dissipation. The storm water management design for the proposed closure is unchanged from the overall drainage pattern of the existing storm water system.

All construction-phase erosion and sediment controls are designed to retain sediment on site to the maximum extent practicable. All control measures selected will be installed and maintained in accordance with the manufacturer's specifications and good engineering practices.

2.2 STABILIZATION PRACTICES

2.2.1 Short and Long Term Goals and Criteria

Short and long term goals will include a variety of controls to stabilize sediment and control erosion around the perimeter of wetlands. All construction-phase erosion and sediment controls will be operational prior to conducting earth-disturbing activities and have been designed to retain sediment on site to the extent practicable, and limit run-off and the discharge of pollutants (sediment) from exposed areas of the site.

All control measures selected will be installed and maintained in accordance with the manufacturer's specifications and good engineering practices. Weekly inspections and routine monitoring will be used to determine the effectiveness of controls in use.

In the case of sedimentation escaping the construction site, off-site accumulations of sediment will be removed on an as needed basis. If necessary, a portable tire washing station will be used to clean sediment from vehicles prior to leaving the site. This type of BMP may be used on an as-needed basis. Sedimentation entering the storm water drainage system will be removed via a variety of BMPs, described in this CSWPPP, which are effective in removing particles from storm water prior to discharge.

Sediment must be removed from sediment traps or the storm water basins when design capacity has been reduced by 50%.

Litter and construction solid debris potentially exposed to the storm water will be prevented from becoming a pollution source through continual monitoring and the use of laborers to "pick" as determined necessary. Waste of this nature will be temporarily stored in containers on-site, and disposed of periodically in the landfill prior to capping or at an approved disposal facility.

2.2.2 Stabilization Practices

The construction site will include numerous stabilizing practices. Sediment and erosion controls (such as erosion mat and hydro-seeding) will act as an interim practice, particularly at the soil stockpiling area. Final permanent stabilization practices include a vegetative support layer where additional exposure could threaten storm water quality.

The soil stockpiling area will be physically separated from other storm water controls, and will be protected from contact with storm water and wind, as practicable.
Stabilization measures will be initiated as soon as practicable (but no later than the end of the next work day) and completed as soon as practicable (but no later than 14 calendar days) in portions of the site where construction activities have temporarily or permanently ceased, except in the following circumstances:

(a) In the event snow cover or frozen ground conditions precludes the initiation of stabilization measures by the end of the next work day, temporary or permanent stabilization measures shall be initiated as soon as practicable.

(b) In the event construction activity and/or earth disturbing activities will be resumed within 14 days. Temporary stabilization measures do not have to be initiated on that portion of site.

(c) In areas experiencing droughts where the initiation of stabilization measures is precluded by seasonably arid conditions. Then, alternate stabilization measures shall be initiated in accordance with the CGP Part 2.2 as needed, and initial stabilization measures shall be initiated as soon as practicable.

2.2.3 Structural Practices

Storm water from the construction activities and the excavation/stockpile storage areas will be collected through a series of swales and culverts, and will discharge to temporary on-site storm water management basins strategically located on the site until permanent stormwater infrastructure is constructed. The storm water management basins will be detention basins utilizing outlet structures that withdraw water from the surface when discharging storm water. These are designed to prevent erosion of the basin outlets to maintain efficiency of the control. Use of the storm water management system will provide protection for nearby waters and wetlands.

2.2.4 Turbidity Control Practices

The construction site may employ the use of FlocLogs® or equivalent products, which will be used in accordance with the manufacturer's instructions. FlocLogs® are pervious bags containing a semi-hydrated gel polyacrylamide material to reduce the turbidity of the storm water run-off from disturbed areas. The FlocLogs® are a flocculent that, when introduced to water, slowly dissolves and attaches itself to colloidal particles, causing the contaminants to fall out of suspension.

FlocLogs® or equivalent products, if used, will be placed into channels known to carry turbid water draining disturbed areas of glacial till soils. The logs will be attached securely to stakes in open channels and tied off to the surface grates of catch basins for control in enclosed channels; either application will allow for storm water flow to pass over the logs for full exposure and treatment.

During construction, storm water flowing off-site will be monitored daily for turbidity. If the measured turbidity exceeds 50 normal turbidity units (NTU) at sedimentation basins, or 30 NTU's at outfalls, the contractor shall put additional sedimentation control measures in place, which may include FlocLogs® or equivalent products, siltation fencing, or additional settling basins.

2.2.5 Erosion and Sediment Control Material Storage

A surplus of erosion and sediment control materials, such as FlocLogs®, erosion netting, siltation fencing, and haybales will be maintained at the project site until stabilization occurs.

2.2.6 Non-Structural Controls

2.2.6.1 Good Housekeeping

Non-structural controls are equally as effective as structural controls in spill prevention. Non-structural controls to be used at the construction site include:

- Regular sweeping of paved surfaces (including vehicle site exit areas); and
- Prompt cleanup of any spilled or waste materials.

Paved areas where sediment has been tracked-out will be maintained at the end of each work day during which the track-out occurs.

2.2.6.2 Exposure Minimization

Exposure will be minimized by providing both permanent and temporary soil stabilization over areas that have been constructed to completion, or areas that will not be revisited within a 14 day period.

Where practicable, industrial materials and activities will be protected from exposure to rain, snow, snowmelt, or run-off.

2.2.7 Preventative Maintenance

A preventative maintenance program includes the timely inspection and maintenance of storm water management devices. Examples of preventative maintenance include:

- Removal of obstructions, if any, from inlets and outlets.
- Removal of accumulated sediment.
- Repair and re-plant slope areas, which experience erosion.
- Repair damaged rip-rap check dams.

2.2.8 Inspections

The Contractor shall inspect the following construction areas as part of the routine CSWPPP inspection procedure at least every 7 calendar days:

- Disturbed areas of the construction site that have not received final stabilization,
- All locations where stabilization measures have been implemented,
- Areas used for storage of materials that are exposed to precipitation, and all other pollution prevention measures included in the SPCC Plan,
- Areas of temporary waste storage,
- Structural control measures,
- Non-structural controls,
- Locations where vehicles enter or exit the site,

- The storm water management basins and discharge outlets, and
- Other areas where storm water leaves the site.

Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for pollutants entering the drainage system.

Existing sediment and erosion control measures shall be observed to ensure that they are operating correctly, and any areas requiring a new or modified storm water control should be identified. The discharge locations or points shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles enter or exit the site shall be inspected for evidence of off-site sediment.

Based on the results of these routine inspections, the Contractor must correct any deficiencies found in the implementation of the CSWPPP as soon as practicable but within 7 days of the inspection if significant alterations are required to correct the deficiency. Results of the inspections, corrective actions taken in response to any deficiencies, and any opportunities for improvement that are identified must be documented in the CSWPPP, with any modifications required within 7 calendar days of completing the work. A blank inspection report is included in Appendix B.

See Section 4.1 of this report for detailed maintenance procedures to be performed as needed following inspection.

2.2.9 Training

A review of the CSWPPP will be provided to construction subcontractors as needed to ensure proper implementation and maintenance of structural and non-structural BMPs. Basic training will include:

- Spill prevention and cleanup measures, including the prohibition of dumping any material into storm drains or waterways

- An understanding of the basic purpose of storm water BMPs, including what common BMPs are on-site, what they should look like, and how to avoid damaging them
- Potential penalties associated with storm water non-compliance

Staff directly responsible for implementing the CSWPPP should receive comprehensive storm water training, including:

- The location and type of BMPs being implemented (including use and handling of flocculants, as applicable)
- The installation requirements and water quality purpose for each BMP
- Maintenance procedures for each of the BMPs being implemented
- Spill prevention and cleanup measures
- Inspection and maintenance recordkeeping requirements, including procedures for corrective action, as necessary

2.3 STORMWATER MANAGEMENT

As described above, storm water from the re-graded site is collected through a series of swales and culverts. Riprap is used as needed to provide velocity dissipation. These swales and culverts will be maintained after construction as part of the permanent drainage system. The storm water collection system discharges to on-site detention basins and off-site into adjacent wetlands.

The existing stormwater management system consists of components designed to minimize erosion of landfill surfaces, prevent run-on of stormwater onto landfilled areas, and control stormwater run-off. The stormwater management system includes vegetated surfaces, flow diversions, channels, swales, culverts, and stormwater basins.

Stormwater components identified and discussed in this application are designed to improve the existing stormwater management system and provide additional control for the landfill after capping is complete.

2.4 OTHER CONTROLS

Other guidelines include:

1. More robust erosion control matting (ECM) will be placed in open channels during periods of high suspended solids in the storm water flow. The matting increases the effectiveness of the FlocLogs® by providing a rough surface for the solids to attach to.
2. No solid materials, including building materials, shall be discharged to waters of the United States, except as authorized by a permit.

3. Off-site vehicle tracking of sediments and the generation of dust shall be minimized though use of methods described in this plan. Additionally, dust control will be conducted using a water truck, provided that appropriate storm water controls are utilized to prevent the discharge of pollutants.

Construction materials and equipment will be stored on the site. Waste materials will be temporarily stored in containers before they are transported to another approved disposal facility. Fueling of construction vehicles and equipment will occur on the site via fuel delivery only. Bates may use an on-site fuel storage. The fuel storage tank will meet all applicable federal, state, and local regulations. Bates will have a plan which addresses procedures for preventing and responding to spills.

Potential pollutant sources from the construction site are primarily sediment and total suspended solids (TSS). The previously described controls will be used to prevent these solids from leaving the site.

2.5 RECORDKEEPING

The CGP requires the following records to be maintained on the site:

1. Dates when major grading activities occur;

2. Dates when construction activities temporarily or permanently cease on a portion of the site; and
3. Dates when stabilization measures are initiated.

In addition, the following records should also be kept for at least 3 years:

- The Stormwater Pollution Prevention Plan (SWPPP) and revisions;
- The NOI and all documentation required to demonstrate eligibility;
- All inspection reports;
- Any spill reports or other corrective action reports;
- The NOT if stormwater discharges cease.

3.0 MAINTENANCE, TRAINING, AND INSPECTIONS

3.1 MAINTENANCE

All erosion and sediment control measures, and other protective measures identified in the CSWPPP, must be maintained in effective operating condition. Routine maintenance includes all minor repairs or other upkeep performed to ensure the site's stormwater controls remain in effective operating condition, not including significant repairs or the need to install a new or replacement control. Maintenance will be performed based on the results of inspections. The program will include the following maintenance activities:

- Catch basins will be cleaned as required. Cleaning will include removing of all sediments.
- Sediment will be removed from the catch basins, manholes and grit chambers once the applicable sediment build up is observed or bi-annually, whichever occurs first.
- Good housekeeping and routine litter pickup will be implemented to prevent the buildup of litter on stormwater catch basins and to prevent litter from entering the stormwater system.
- The paved areas or construction entrances of the Facility will be swept/cleaned once per month during construction activity to control dust and help to reduce sediment from entering into the stormwater system.
- Erosion controls (silt fence, hay bales, compost sock, etc.) will be replaced before sediment has accumulated to one-half of the aboveground height.

If site inspections identify BMPs that are not operating effectively, maintenance will be performed and completed by the close of the next workday following the inspection for minor repairs or modifications, or within seven (7) days of the inspection for significant repairs or installation of a new device. If it is infeasible to complete the maintenance activities within 7 calendar days, documentation must be included in the CSWPPP describing the reason it is infeasible, and the maintenance should be performed as soon as practicable.

3.2 TRAINING

Training of personnel is essential to achieving proper operation and maintenance of the stormwater management system. As such, a review of the CSWPPP will be provided to construction subcontractors as needed to ensure proper implementation and maintenance of structural and non-structural BMPs. Basic training will include:

- Spill prevention and cleanup measures, including the prohibition of dumping any material into storm drains or waterways;
- Good housekeeping measures;
- An understanding of the basic purpose of stormwater BMPs, including what common BMPs are on-site, what they should look like, and how to avoid damaging them; and
- Potential penalties associated with stormwater non-compliance.

Staff directly responsible for implementing the CSWPPP should receive comprehensive stormwater training, including:

- The location and type of BMPs being implemented;
- The installation requirements and water quality purpose for each BMP;
- Maintenance procedures for each of the BMPs being implemented;
- Spill prevention and cleanup measures;
- Inspection and maintenance recordkeeping requirements, including procedures for corrective action, as necessary; and
- Permit deadlines associated with installation, maintenance, and removal of temporary stormwater and erosion controls.

A blank training record is included in Appendix J.

3.3 INSPECTIONS

The project will be inspected once every seven days in accordance with U.S. EPA's 2022 Multi Sector General Permit. Inspections will occur after major storm events to ensure that the system functions to prevent erosion, prevent discharge of pollutants, and protect the physical integrity of the landfill. These inspections will be performed in accordance with the U.S. EPA's 2022 Multi Sector General Permit for stormwater discharges, as amended or updated.

Sedimentation basins, perimeter swales and drainage structures on the landfill will be inspected and maintained as needed to ensure that a buildup of silts and sediments does not occur.

3.3.1 General Inspection Procedure

At a minimum, qualified personnel must conduct a site inspection in accordance with one of the two schedules:

- At least once every seven calendar days; or
- Once every 14 calendar days and within 24 hours of 0.25 inches of precipitation events or greater over 24 hours, or within 24 hours of a discharge that occurred due to snowmelt from 3.25 inches or greater of snow accumulation. During the high flow periods in spring (i.e., months of April to June), inspection frequency shall be increased to once per week.

For rainfall measurement, a properly maintained rain gauge must be kept on site, or storm event information can be obtained from a representative weather station. Snowfall measurements can be taken at the site, or the operator can rely on similar information from a local weather forecast.

In areas that have been finally or temporarily stabilized, or if run-off is unlikely due to winter conditions that will likely persist for at least three months (e.g., site is covered with snow, ice, or frozen ground exists) inspections will be conducted at least once every month.

The owner/operator is eligible for a waiver of monthly inspection requirements, until thawing conditions begin to occur and are expected to result in a discharge, if all of the following requirements are met:

- The project is located in an area where frozen conditions are anticipated to continue for extended periods of time (i.e., at least three months);
- Land disturbance activities have been suspended;
- All disturbed areas of the site have been temporarily or permanently stabilized; and
- The beginning and ending dates of the waiver period are documented in the CSWPPP.

Qualified personnel will inspect the following areas:

- Disturbed areas of the construction site that have not been finally stabilized,
- All locations where stabilization measures have been implemented,
- Areas used for storage of materials, equipment, and waste that are exposed to precipitation, and all other pollution prevention measures,
- Areas of temporary waste storage,
- Structural control measures,
- Non-structural controls,
- Locations where vehicles enter or exit the site,
- The stormwater management system and discharge outlets, and
- Other areas where stormwater leaves the site.

Inspections must include all disturbed areas and areas used for storage of materials that are exposed to precipitation. These areas must be inspected for evidence of, or the potential for, pollutants entering the drainage system.

Sediment and erosion control measures must be observed to ensure that they are operating correctly, and the need for new or modified stormwater controls should be identified. Inspections must note any sediment deposition that are attributable to the Site's discharge (e.g., sand bars with no vegetation growing on top in receiving waters or in other constructed or natural site drainage

features, or the buildup of sediment deposits on nearby streets, curbs, or open conveyance channels). Discharge locations must be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Any discharges occurring during inspection must be observed for any indications of the presence of stormwater pollutants and the results shall be documented. Locations where vehicles enter or exit the site must be inspected for evidence of off-site sediment.

Below are additional inspection requirements as part of the routine CSWPPP inspection procedure:

- Siltation barriers shall be inspected prior to construction.
- The entire site shall be inspected on a monthly basis during the construction activity.
- Deep sump catch basins, manholes and grit chamber unit shall be inspected on a monthly basis while construction activity is occurring. Once the construction activity has completed, then the structures shall be inspected on a bi-annual basis, except the grit chamber unit shall be inspected and maintained per manufacturer's specifications.
- Slopes shall be inspected after rainstorm events for signs of erosion.

3.3.1.1 Inspection Reports

An inspection report summarizing the scope of the inspection will be completed within 24 hours of the inspection and include, at a minimum:

- The date(s) of the inspection;
- Name(s), titles(s) and qualifications of personnel making the inspection;
- Weather information for the period since the last inspection,
- Current weather information and a description of any discharges occurring at the time of the inspection; and
- Major observations relating to the implementation of the CSWPPP.
- Major observations, if any, should include:
    - The location(s) of discharges of sediment or other pollutants from the site;
    - Location(s) of BMPs that need to be maintained;

    - Location(s) of BMPs that failed to operate as designed or proved inadequate for a particular location;
    - Location(s) where additional BMPs are needed that did not exist at the time of inspection; and
- Corrective actions required as described below, including any necessary changes to the CSWPPP.

A blank corrective action form is included in Appendix C.

A record of each inspection and of any actions taken in accordance with the inspection must be kept on-site or in a readily available location while the permit is active, and records must be retained as part of the CSWPPP for at least three years from the date that permit coverage expires or is terminated. Where a report does not identify any incidents of non-compliance, the report must contain a certification that the Facility is in compliance with the CSWPPP and CGP. The report must be signed and certified in the same manner as this CSWPPP.

A blank inspection report is included in Appendix B.

3.4 CORRECTIVE ACTION

Corrective action needs to be taken to address any of the following conditions:

- A stormwater control needs a significant repair or a new or replacement control is needed;
- A control requires the same routine maintenance repeatedly (i.e., three or more times);
- A stormwater control necessary to comply with the requirements of this permit was never installed, or was installed incorrectly;
- Discharges do not meet applicable water quality standards;
- A prohibited discharge has occurred; or
- During discharge from site dewatering activities, the weekly average of the turbidity monitoring results exceeds the 50 NTU, or indications of pollutant discharge were observed.

If corrective actions are necessary, implementation must be completed as soon as practicable but within seven days of the inspection if significant alterations are required to correct the deficiency. If it is infeasible to complete the maintenance activities within seven calendar days, documentation must be included in the CSWPPP describing the reason it is infeasible, and the maintenance should be performed as soon as practicable. In all circumstances requiring corrective action, all reasonable steps to minimize or prevent discharge of pollutants must be taken immediately until a permanent solution is in effect.

If a discharge of pollutants warranting notification to the EPA Regional Office is detected, they must be notified by the end of the next workday. Notification is completed via the EPA's electronic NOI system.

For each corrective action, a report must be completed within 24 hours of discovering an occurrence/deficiency, which shall include details regarding the condition and nature of the condition identified, as well as when and how it was identified. Within seven calendar days of discovering an occurrence/deficiency, a report must be completed including the following information:

- Any follow-up maintenance or actions performed to correct the deficiency;
- A summary of stormwater control modifications performed or that will be performed, including a schedule of activities to complete the modifications, as necessary; and
- Notice of whether CSWPPP revisions are required.

If site dewatering activities trigger corrective actions, all reasonable steps must be taken to minimize or prevent the discharge of pollutants until a solution can be implemented. Controls must be assessed, adjusted or repaired to ensure they are operating effectively and that turbidity levels are below the benchmark or pollution is removed.

Each corrective action report must be signed and certified in the same manner as this CSWPPP.

Reports must be kept on-site or in a readily available location while the permit is active, and records must be retained as part of the CSWPPP for at least three years from the date that permit coverage expires or is terminated.

A blank corrective action form is included in Appendix C.

3.4.1 CSWPPP Revisions

The CSWPPP must be modified as necessary (e.g., show additional controls on map; revise description of controls) to include additional or modified BMPs designed to correct problems identified by site inspections. Revisions to the CSWPPP must be completed within seven calendar days of completing the corrective action work.

4.0 DOCUMENTATION OF COMPLIANCE WITH OTHER FEDERAL REQUIREMENTS

4.1 ENDANGERED SPECIES

Storm water discharge from the landfill closure construction project will not adversely affect any endangered or threatened species of plants, fish or wildlife or their designated critical habitats, therefore meeting applicable criteria in Appendix D of the ESA Eligibility Criteria of the CGP.

A review of the current Natural Heritage and Endangered Species Program database maintained by MassGIS revealed that there are no Natural Heritage Endangered Species Program (NHESP) Estimated Habitat or Rare Wildlife in Wetland Areas in or near the vicinity of the facility. Additionally, no Areas of Critical Environmental Concern (ACECs) are located near the facility. Vernal pools as delineated on the erosion and sediment control plan will be maintained and protected in accordance with all applicable permit approvals.

A MassGIS Priority Resource Map depicting the facility is included in Appendix F.

Due to site location, the National Marine Fisheries Service was not contacted.

4.2 HISTORIC PLACES

The stormwater discharges associated with the proposed construction do not have the potential to have an effect on historic properties; furthermore, a review of historical properties was conducted through a review of the Massachusetts Cultural Resource Information System (MACRIS). The search of the database indicated that there are no historic places within the proposed project limits. Documentation regarding queries of the MACRIS and National Register Information System (NRIS) databases is included in Appendix G.

4.3 TOTAL MAXIMUM DAILY LOADS (TMDLS)

In Massachusetts, construction activities fully and properly implementing the requirements of the CGP shall be deemed to be meeting the requirements and assumptions of any TMDL at this time.

4.4 APPLICABLE STATE, TRIBAL, OR LOCAL PROGRAMS

The CSWPPP must be consistent with all applicable federal, state, tribal or local requirements for soil and erosion control and storm water management. The CSWPPP must also be consistent with requirements specified in applicable sediment and erosion site plans or site permits, or storm water management site plans or site permits approved by state or local officials. Applicable permits related to the landfill closure will be available on-site and as requested.

5.0 CSWPPP REVIEW AND AVAILABILITY

5.1 CSWPPP REVIEW AND AVAILABILITY

A copy of the CSWPPP, the CGP and the NOI submitted to the EPA must be retained at the construction site from the date of project initiation to the date of final stabilization. This information must be accessible and be made available on request of the EPA; any State or local agency approving sediment and erosion plans, grading plans, or stormwater management plans; local government officials; the operator of a municipal separate storm sewer receiving discharges from the site; and representatives of the U.S. Fish and Wildlife Service or the National Marine Fisheries Service. The on-site copy of the CSWPPP must be made available in its entirety to the EPA staff for review and copying at the time of an on-site inspection.

General contractors with day-to-day operational control over CSWPPP implementation must have a copy of the CSWPPP available at a central location on site for the use of all operators and those identified as having responsibilities under the CSWPPP whenever they are on the construction site.

5.2 NOTICE POSTING

A notice must be posted conspicuously near the main entrance of the construction site with the following information:

- A copy of the completed NOI with the NPDES Permit tracking number as submitted to the EPA Storm water Notice Processing Center; and
- The current location of the CSWPPP and name and telephone number of the contact person for scheduling CSWPPP viewing times, if different from that given in the NOI.

However, this CGP requirement does not provide the public with any right to trespass on a construction site for any reason, including inspection of a site; nor does the CGP require that owners allow members of the public access to a construction site.

5.3 NOTICE OF TERMINATION (NOT)

When storm water discharges from construction activities cease, owners wishing to terminate coverage under the CGP must submit a Notice of Termination (NOT). Compliance with this permit is required until an NOT is submitted. The permittee's authorization to discharge under this permit terminates at midnight of the day the NOT is signed.

All permittees must submit an NOT within thirty (30) days after one or more of the following conditions have been met:

- Final stabilization has been achieved on all portions of the site;
- Another operator/permittee has assumed control over all areas of the site that have not been finally stabilized, and that operator has submitted an NOI and obtained coverage under the CGP; or
- Coverage under an individual or alternative general NPDES permit has been obtained.

Prior to filing the NOT, the following must be accomplished at the construction site:

- Remove any construction debris and trash;
- Remove temporary BMPs (such as silt fence). Remove any residual sediment as needed. Seed and mulch any small bare spots to achieve soil stabilization. BMPs that will decompose, including some fiber rolls and blankets, may be left in place;
- Check areas where erosion-control blankets or matting were installed. Cut away and remove all loose, exposed material, especially in areas where walking or mowing will occur. Reseed all bare soil areas;
- Ensure that 70 percent of background native vegetation coverage or equivalent stabilization measures have been applied for final soil stabilization of disturbed areas, providing non-vegetative erosion controls to the area while vegetation is becoming established, as necessary;
- Repair any remaining signs of erosion;
- Ensure that post-construction BMPs are in place and operational. Provide written maintenance requirements for all post-construction BMPs to the appropriate party;

- Check all drainage conveyances and outlets to ensure they were installed correctly and are operational. Inspect inlet areas to ensure complete stabilization and remove any brush or debris that could clog inlets. Ensure banks and ditch bottoms are well vegetated. Reseed bare areas and replace rock that has become dislodged;
- Seed and mulch or otherwise stabilize any areas where run-off flows might converge or high velocity flows are expected;
- Remove temporary stream crossings. Grade, seed, or re-plant vegetation damaged or removed; and
- Ensure subcontractors have repaired their work areas before final closeout.

Enforcement actions may be taken if a permittee submits an NOT without meeting one or more of these conditions.

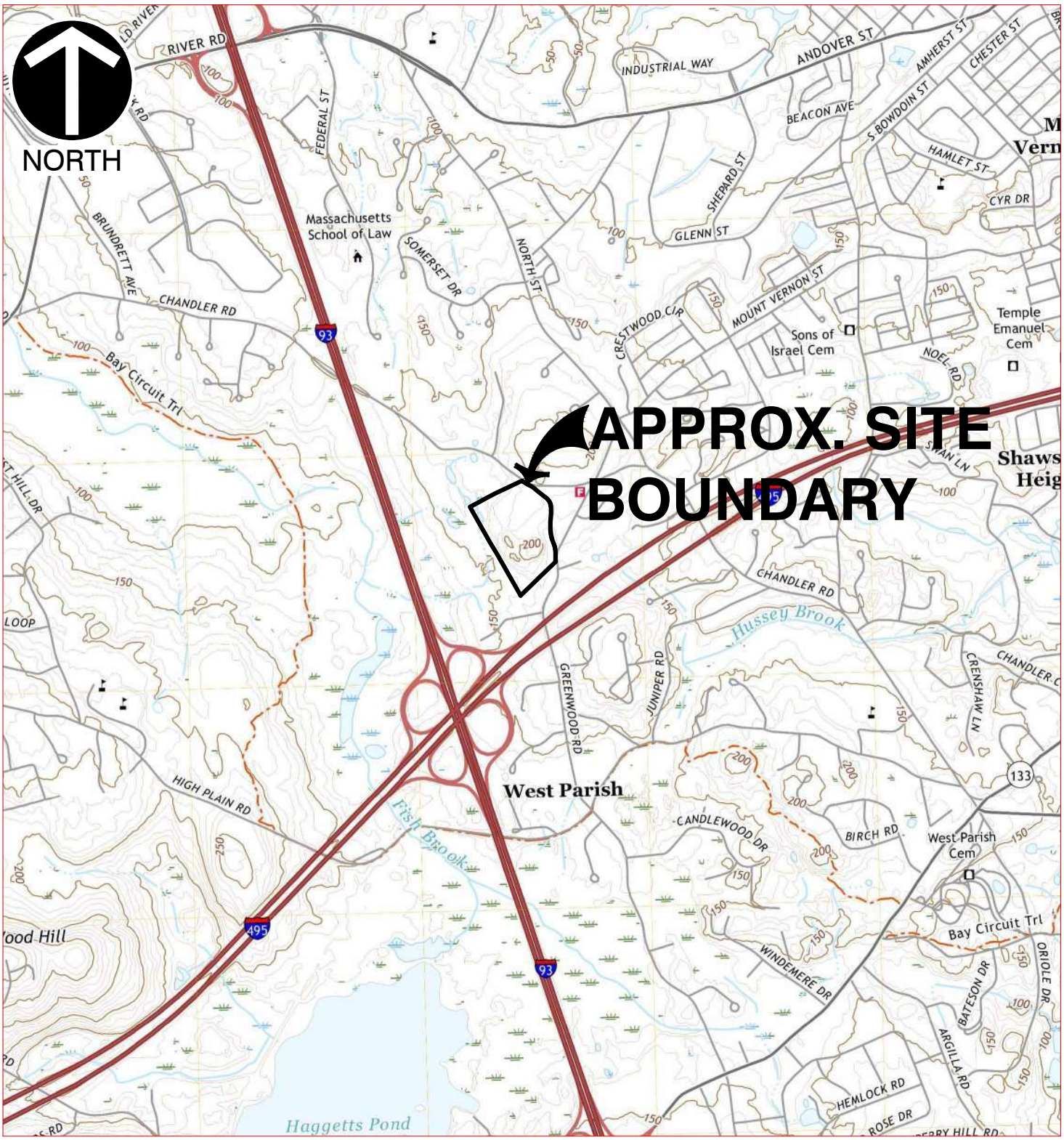
In order to file an NOT, the following information is required in the submittal, at minimum:

- NPDES permit tracking number provided by EPA upon permit approval;
- Conditions met allowing NOT to be submitted (see above);
- Operator contact information and project name/ address; and
- NOT certification (via the NOT Form).

5.4 COPY OF PERMIT REQUIREMENTS

The CGP is included in hard copy format within this document (Appendix L). The NOI form will be submitted prior to land disturbance and the signed and certified NOI form will be included in Appendix A, along with an acknowledgement of receipt from the EPA Stormwater Processing Center stating that the NOI is administratively complete.

FIGURES



REFERENCE

1. U.S.G.S. 7.5' TOPOGRAPHIC MAP, LAWRENCE QUADRANGLE, MA DATED: 2021, ACCESSED 08/18/2023.

SCALE IN FEET

0 2000 4000

Civil & Environmental Consultants, Inc.
31 Bellows Road · Raynham, MA 02767
Ph: 774.501.2176 · 866.312.2024 · Fax: 774.501.2669
www.cecinc.com

LEDGE ROAD LANDFILL
10 LEDGE ROAD
ANDOVER, MASSACHUSETTS

SITE LOCATION MAP

DRAWN BY:	RHI	CHECKED BY:	CSD	APPROVED BY:	CSD	FIGURE NO.:	1
DATE:	AUGUST 2023	DWG SCALE:	1"=2000'	PROJECT NO:	334-409		

\\cecinc.com\global\Projects\330-000\334-409\-CADD\Dwg\334409-SW01-Site Locus.dwg{LAYOUT} LS:(8/18/2023 - rivers) - LP: 8/18/2023 2:19 PM

XREFs: [Wetland Survey Dwg - WSP 9.2.15, Final_Grading-Working, CDMS_2436, Full Site Survey Revised 5.11.16, C0016RPL, 16365-CS-BN] Images: []
Last saved by: HEILJR Time: 1/26/2023 10:24:51 AM
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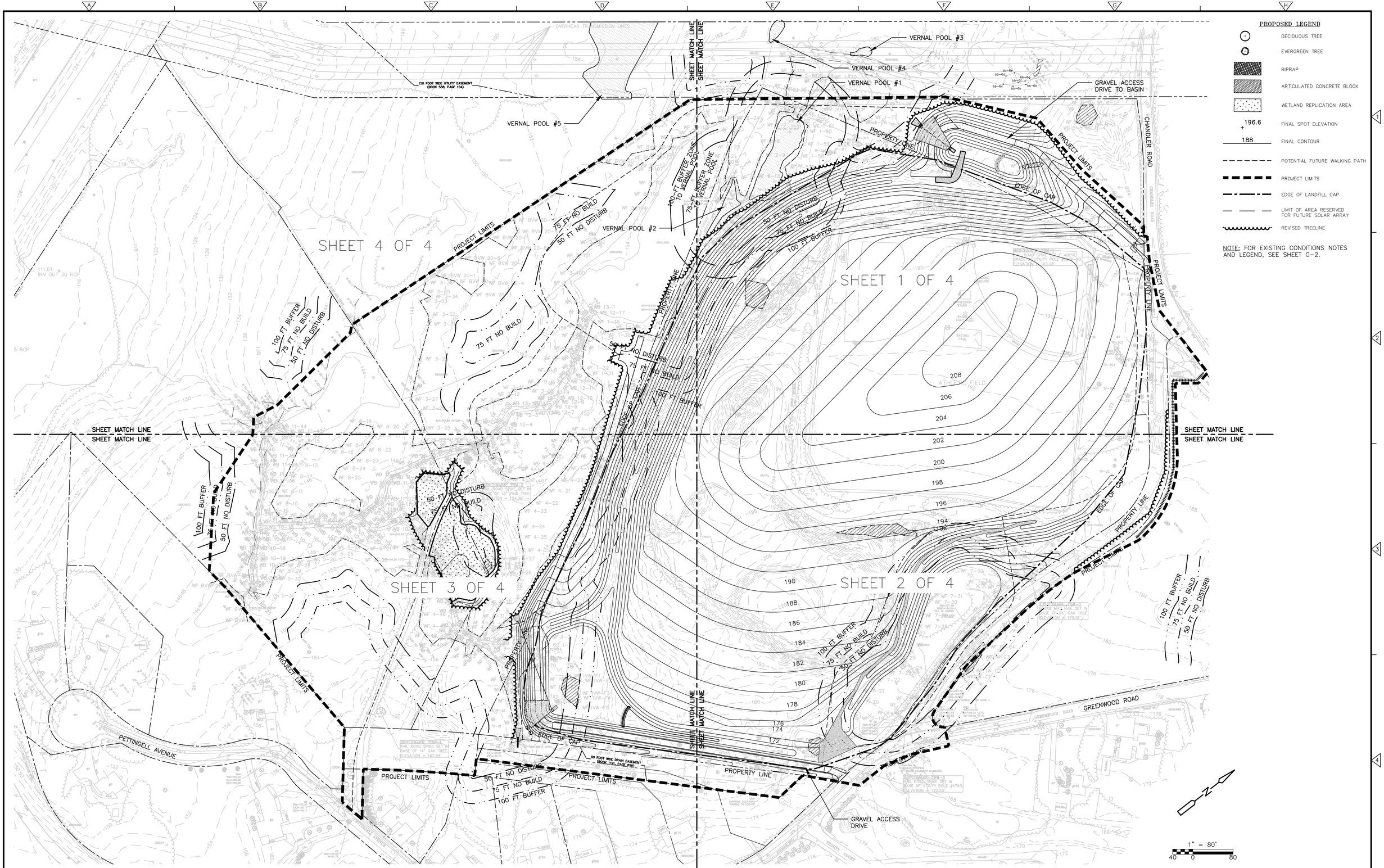

PROPOSED LEGEND

- DECIDUOUS TREE
- EVERGREEN TREE
- RIPRAP
- ARTICULATED CONCRETE BLOCK
- WETLAND REPLICATION AREA
- 196.6 + FINAL SPOT ELEVATION
- 188 FINAL CONTOUR
- POTENTIAL FUTURE WALKING PATH
- PROJECT LIMITS
- EDGE OF LANDFILL CAP
- LIMIT OF AREA RESERVED FOR FUTURE SOLAR ARRAY
- REVISED TREELINE

NOTE: FOR EXISTING CONDITIONS NOTES AND LEGEND, SEE SHEET G-2.

REV. NO.	DATE	DRWN	CHKD	REMARKS
3	3/2023	JRH	NEJ	UPDATED FOR BIDDING
2	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE/ DPW MATERIALS HANDLING AREA
1	4/2017	JRH	NEJ	REVISED TO RESPOND TO CONSERVATON COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY: G. HOWARD
DRAWN BY: J. HEIL
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: MARCH 2023

CDM Smith
75 State Street, Suite 701
Boston, MA 02109
Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

OVERALL SITE KEY PLAN

PROJECT NO. 0235-113811
FILE NAME: G003KYPL.DWG

SHEET NO.
G-3

XREFs: [Wetland Survey Dwg - WSP 9.2.15, Final_Grading-Working, CDMS_2436, Full Site Survey Revised 5.11.16, C0016GRPL, C007-SRP_OLDFILE, 16365-CS-BN] Images: []
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STAKE PROPERTY BOUNDARY
VERNAL POOL #3
VERNAL POOL #4
VERNAL POOL #1
LIMIT OF PROPERTY BOUNDARY STAKING
150 FOOT WIDE UTILITY EASEMENT (BOOK 538, PAGE 104)
VERNAL POOL #5
75 FT NO BUILD
50 FT NO DISTURB
PROJECT LIMITS
PROPERTY LINE
CHANDLER ROAD
STAKE PROPERTY BOUNDARY
100-FT BUFFER ZONE TO VERNAL POOL
75-FT BUFFER ZONE TO VERNAL POOL
EDGE OF WASTE
VERNAL POOL #2
50 FT NO DISTURB
75 FT NO BUILD
100 FT BUFFER
LIMIT OF PROPERTY BOUNDARY STAKING
100 FT BUFFER
75 FT NO BUILD
50 FT NO DISTURB
50 FT NO DISTURB
75 FT NO BUILD
100 FT BUFFER
EDGE OF WASTE
ATHLETIC FIELD
2432 SQ. FT.
CONTRACTOR STAGING AREA
100 FT BUFFER
75 FT NO BUILD
50 FT NO DISTURB
TEMPORARY STAGING AREA FOR WETLAND SOILS REMOVAL OPERATIONS (APPROXIMATE)
HAUL ROAD FOR TRANSPORTING WETLAND SOILS TO DRYING/DISPOSAL AREA
PROJECT LIMITS
PROPERTY LINE
1205 SQ. FT.
100 FT BUFFER
75 FT NO BUILD
50 FT NO DISTURB
TEMPORARY ACCESS ROUTES FOR WETLAND SOILS REMOVAL IN UPLAND AREAS (TYP.)
PETTINGELL AVENUE
GREENWOOD ROAD
EDGE OF WASTE
50 FOOT WIDE DRAIN EASEMENT (BOOK 1181, PAGE 958)
PROJECT LIMITS
50 FT NO DISTURB
75 FT NO BUILD
100 FT BUFFER
PROPERTY LINE
PROJECT LIMITS
NO ACCESS TO LEDGE ROAD DURING CONSTRUCTION INSTALL HARD BARRICADE FOR DURATION OF PROJECT
GREENWOOD ROAD TO REMAIN OPEN TO TRAFFIC THROUGHOUT CONSTRUCTION
3 / ES-2 STABILIZED CONSTRUCTION ENTRANCE – CONTRACTOR ACCESS ONLY DURING CONSTRUCTION (NO DELIVERIES)
ACCESS FOR WETLAND MONITORING AND MAINTENANCE OF WETLAND RESTORATION/REPLICATION ONLY RELOCATE EXISTING ENTRANCE ONTO TOWN PROPERTY DURING CONSTRUCTION
TEMPORARY CONSTRUCTION EASEMENT

PROPOSED LEGEND

- TEMPORARY FENCE
- HARD BARRICADE
- APPROXIMATE LANDFILL EDGE OF WASTE
- PROJECT LIMITS
- TIMBER MAT
- TEMPORARY CONSTRUCTION EASEMENT
- CONTRACTOR STAGING AREA

EXISTING LEGEND SEE SHEET G-2

NOTE:
1. ALL STAGING AREAS SHALL BE OUTSIDE 100 FOOT BUFFERS

ACCESS DURING CONSTRUCTION AND FOR DELIVERIES

3 / ES-2 STABILIZED CONSTRUCTION ENTRANCE

AREA DESIGNATED FOR WETLAND SOILS DRYING AND FINAL DEPOSITION OF WETLAND SOILS AND RELOCATED WASTE

CONTRACTOR STAGING AREA

1" = 80'
40 0 80

COMMONWEALTH OF MASSACHUSETTS
NATHAN E. JONES
No. 47566
REGISTERED PROFESSIONAL ENGINEER
3/3/2023

REV. NO.	DATE	DRWN	CHKD	REMARKS
2	3/2023	JRH	NEJ	UPDATED FOR BIDDING
1	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE/ DPW MATERIALS HANDLING AREA

DESIGNED BY: G. HOWARD
DRAWN BY: J. HEIL
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: MARCH 2023

CDM Smith
75 State Street, Suite 701
Boston, MA 02109
Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

SITE ACCESS AND CONSTRUCTION STAGING PLAN

PROJECT NO. 0235-113811
FILE NAME: G004ASPL.DWG
SHEET NO. G-4

XREFs: [Wetland Survey Dwg - WSP 9.2.15, Find_Grading-Working, CDMS_2436, Full Site Survey Revised 5.11.16, CD01GRPL, C007-SRP_OLDFILE, 16365-CS-BN] Images: [
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VERNAL POOL #5
VERNAL POOL #4
VERNAL POOL #3
VERNAL POOL #1
VERNAL POOL #2
150 FOOT WIDE UTILITY EASEMENT (BOOK 538, PAGE 104)
OVERHEAD TRANSMISSION LINES
EDGE OF WASTE
PROPERTY LINE
TIMBER MAT (5/ES-2)
COMPOST SOCK (APPROX. 1,135 LF) (1/ES-2)
COMPOST SOCK (APPROX. 1,412 LF) (1/ES-2)
COMPOST SOCK (APPROX. 907 LF) (1/ES-2)
COMPOST SOCK (APPROX. 74 LF) (1/ES-2)
COMPOST SOCK (APPROX. 1,745 LF) (1/ES-2)
COMPOST SOCK (APPROX. 2,015 LF) (1/ES-2)
COMPOST SOCK (APPROX. 405 LF) (1/ES-2)
COMPOST SOCK (APPROX. 200 LF) (1/ES-2)
STABILIZED CONSTRUCTION ENTRANCE (3/ES-2)
STABILIZED CONSTRUCTION ENTRANCE – CONTRACTOR ACCESS ONLY DURING CONSTRUCTION (NO DELIVERIES) (3/ES-2)
100 FT BUFFER
75 FT NO BUILD
50 FT NO DISTURB
200 FT BUFFER ZONE TO VERNAL POOL
75 FT BUFFER ZONE TO VERNAL POOL
2432 SQ. FT.
1205 SQ. FT.
50 FOOT WIDE DRAIN EASEMENT (BOOK 1181, PAGE 936)
BENCHMARK TBM=C
BENCHMARK TBM=D
111.61 INV OUT 30 RCP
5 RCP

LEGEND
- TEMPORARY COFFER DAM, SEE SHEET C-7
- COMPOST SOCK (1/ES-2)
- LIMITS OF TIMBER MAT (5/ES-2)
- APPROXIMATE LIMITS OF TEMPORARY ACCESS HAUL ROUTE

NOTES:
1. CONTRACTOR SHALL INSTALL AND MAINTAIN CATCH BASIN FILTERS IN ALL PROPOSED CATCH BASINS, AS SHOWN ON SHEETS C-14 THRU C-17, UNTIL ALL CONSTRUCTION ACTIVITIES ARE COMPLETED. (4/ES-2)
2. FOR EXISTING CONDITIONS NOTES AND LEGEND, SEE SHEET G-2.

1" = 80'
40 0 80

REV. NO.	DATE	DRWN	CHKD	REMARKS
3	3/2023	JRH	NEJ	UPDATED FOR BIDDING
2	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE / DPW MATERIALS HANDLING AREA
1	4/2017	JRH	NEJ	REVISED TO RESPOND TO COMMENTS FROM THE U.S. ARMY CORPS. OF ENGINEERS

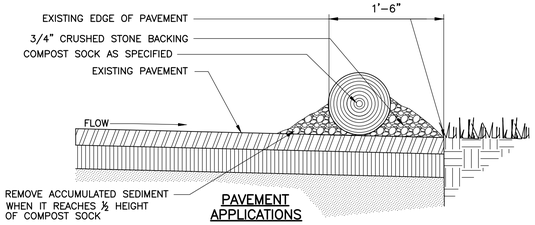
DESIGNED BY: N. JONES
DRAWN BY: J. HEIL
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: MARCH 2023

CDM Smith
75 State Street, Suite 701
Boston, MA 02109
Tel: (617) 452-6000

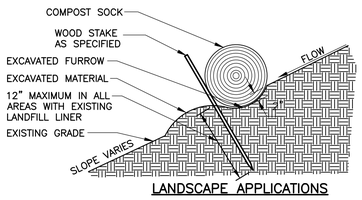
TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

EROSION AND SEDIMENTATION CONTROL PLAN

PROJECT NO. 0235-113811
FILE NAME: ES01ESPL.DWG
SHEET NO. ES-1



PAVEMENT APPLICATIONS

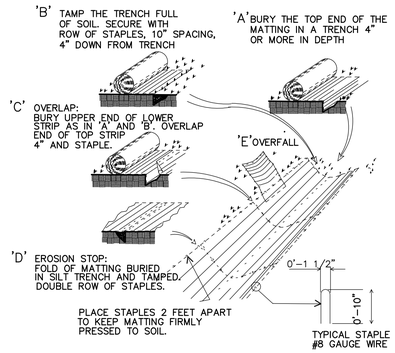


LANDSCAPE APPLICATIONS

COMPOST SOCK

DETAIL 1 / ES-2

SCALE: NTS

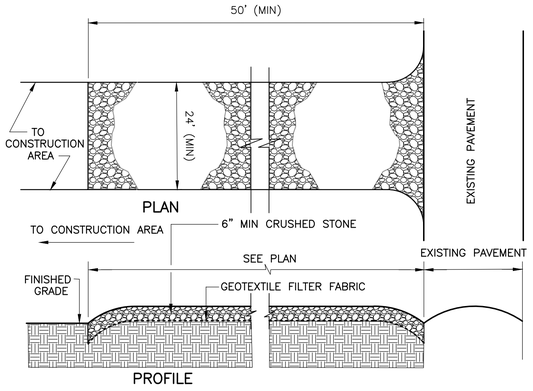

'B' TAMP THE TRENCH FULL OF SOIL. SECURE WITH ROW OF STAPLES, 10" SPACING, 4" DOWN FROM TRENCH
'A' BURY THE TOP END OF THE MATTING IN A TRENCH 4" OR MORE IN DEPTH
'C' OVERLAP: BURY UPPER END OF LOWER STRIP AS IN 'A' AND 'B'. OVERLAP END OF TOP STRIP 4" AND STAPLE.
'E' OVERFALL
'D' EROSION STOP: FOLD OF MATTING BURIED IN SILT TRENCH AND TAMPED. DOUBLE ROW OF STAPLES.
0'-1 1/2"
0'-10"
PLACE STAPLES 2 FEET APART TO KEEP MATTING FIRMLY PRESSED TO SOIL.
TYPICAL STAPLE #8 GAUGE WIRE

EROSION CONTROL BLANKET

DETAIL 2 / ES-2

NOT TO SCALE

NOTE:
1.) APPLY ON ALL NEW LOAM AND SEEDED SLOPES STEEPER THAN 4(H):1(V).



NOTES:

1.) PROVIDE APPROPRIATE TRANSITION BETWEEN STABILIZED CONSTRUCTION ENTRANCE AND EXISTING PAVEMENT.

2.) LIMITS OF STABILIZED CONSTRUCTION ENTRANCE SHALL BE AS DIRECTED BY THE ENGINEER.

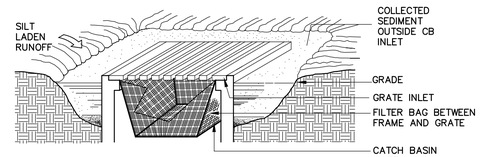
3.) THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO EXISTING PAVEMENT. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR ADDING STONE TO THE LENGTH OF THE ENTRANCE.

4.) REPAIR AND CLEANOUT MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO EXISTING PAVEMENT SHALL BE REMOVED AS DIRECTED BY THE ENGINEER.

STABILIZED CONSTRUCTION ENTRANCE

DETAIL 3 / ES-2

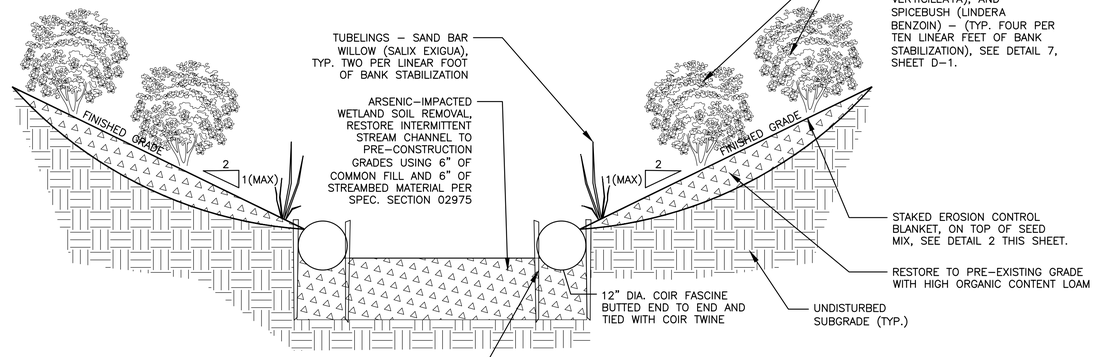
NOT TO SCALE



CATCH BASIN FILTER

DETAIL 4 / ES-2

NOT TO SCALE


TUBELINGS – SAND BAR WILLOW (SALIX EXIGUA), TYP. TWO PER LINEAR FOOT OF BANK STABILIZATION
ARSENIC-IMPACTED WETLAND SOIL REMOVAL, RESTORE INTERMITTENT STREAM CHANNEL TO PRE-CONSTRUCTION GRADES USING 6" OF COMMON FILL AND 6" OF STREAMBED MATERIAL PER SPEC. SECTION 02975
FINISHED GRADE
2
1(MAX)
SHRUB PLANTING – NORTHERN ARROWWOOD (VIBURNUM RECOGNITUM), WINTERBERRY (ILEX VERTICILLATA), AND SPICEBUSH (LINDERA BENZOIN) – (TYP. FOUR PER TEN LINEAR FEET OF BANK STABILIZATION), SEE DETAIL 7, SHEET D-1.
STAKED EROSION CONTROL BLANKET, ON TOP OF SEED MIX, SEE DETAIL 2 THIS SHEET.
RESTORE TO PRE-EXISTING GRADE WITH HIGH ORGANIC CONTENT LOAM
12" DIA. COIR FASCINE BUTTED END TO END AND TIED WITH COIR TWINE
UNDISTURBED SUBGRADE (TYP.)
(2) 4' LONG HARDWOOD STAKES APPROX. 4'-0" O.C. – INSTALL PER MANUFACTURERS INSTRUCTIONS

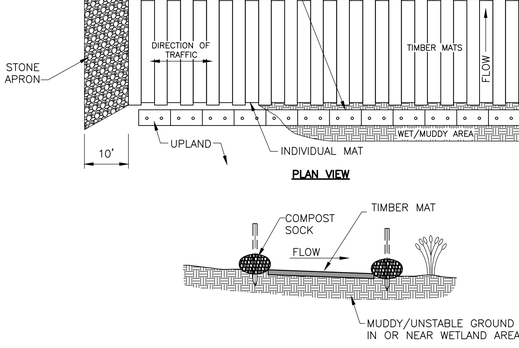
NOTE:
1. TUBELINGS SHALL BE FURNISHED IN NURSERY GROWN CONTAINERS–GROWN FOR A MINIMUM OF ONE SEASON AND HARDENED OFF AND SHALL BE AS MANUFACTURED BY NEW ENGLAND WETLAND PLANTS AMHERST, MA (TEL NO 413–548–8000) OR EQUAL.

2. TUBELINGS SHALL BE INSTALLED IN A STRAIGHT LINE BEHIND FASCINE. PLANT TUBELINGS BY DRIVING A 1.75–IN DIAMETER HOLE INTO SOIL. WHEN TUBELINGS ARE REMOVED FROM CONTAINERS ENSURE THAT ROOTS REMAIN ENCASED IN POTTING SOIL. FIT TUBELINGS INTO DRIVEN HOLES AND FIRM UP SOIL AROUND PLANTED TUBELING. IMMEDIATELY AFTER PLANTING SOAK PLANTED AREAS AND CONTINUE TO KEEP MOIST FOR A MINIMUM OF TWO WEEKS.

BANK STABILIZATION WITH COIR FASCINE, TUBELINGS AND SHRUB PLANTINGS

DETAIL 6 / ES-2

NOT TO SCALE



ELEVATION VIEW

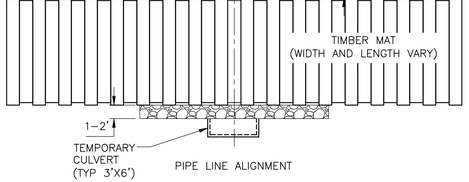
NOTES:

1. PLACE TIMBER MATS SO PLANKS ARE PERPENDICULAR TO DIRECTION OF TRAFFIC.
2. REMOVE SEDIMENT DEPOSITS ALONG EDGES OF MATS ON A REGULAR BASIS.
3. LENGTH OF MAT VARIES. SEE SHEETS C-7 THROUGH C-9 FOR LENGTHS.
4. WIDTH VARIES BY MULTIPLES OF 4-FT. TYPICAL WIDTH IS 12-FT.
5. SOURCE: USACE – NEW ENGLAND DISTRICT, NE GP PERMIT RESOURCES, CONSTRUCTION MAT BMP'S – 6/10/13 DRAFT.

TIMBER MAT

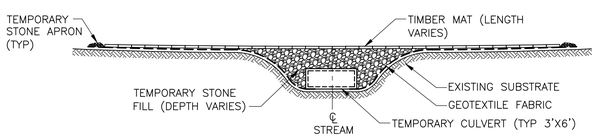
DETAIL 5 / ES-2

NOT TO SCALE



PLAN VIEW

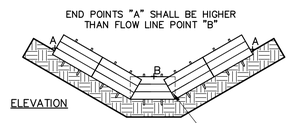
PLAN VIEW

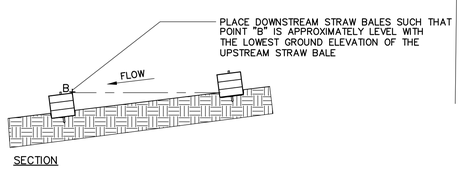


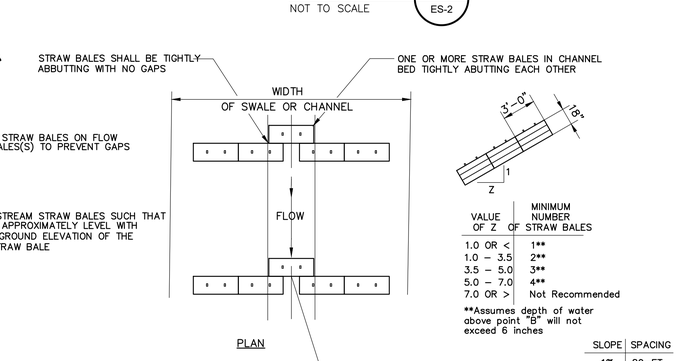
CROSS-SECTION

NOTES:

1. WIDTH OF TEMPORARY STONE FILL SHALL NOT EXCEED 35-FT.


END POINTS "A" SHALL BE HIGHER THAN FLOW LINE POINT "B"
A
B
ELEVATION
OVERLAP SIDE STRAW BALES ON FLOW LINE STRAW BALES(S) TO PREVENT GAPS


PLACE DOWNSTREAM STRAW BALES SUCH THAT POINT "B" IS APPROXIMATELY LEVEL WITH THE LOWEST GROUND ELEVATION OF THE UPSTREAM STRAW BALE
FLOW
B
SECTION


STRAW BALES SHALL BE TIGHTLY ABBUTTING WITH NO GAPS
ONE OR MORE STRAW BALES IN CHANNEL BED TIGHTLY ABUTTING EACH OTHER
WIDTH OF SWALE OR CHANNEL
FLOW
PLAN
PLACE DOWNSTREAM STRAW BALES SUCH THAT POINT "B" IS APPROXIMATELY LEVEL WITH THE LOWEST GROUND ELEVATION OF THE UPSTREAM STRAW BALE
3'-0"
18"
Z
1

VALUE OF Z	MINIMUM NUMBER OF STRAW BALES
1.0 OR <	1**
1.0 – 3.5	2**
3.5 – 5.0	3**
5.0 – 7.0	4**
7.0 OR >	Not Recommended

**Assumes depth of water above point "B" will not exceed 6 inches

SLOPE	SPACING
1%	80-FT
2%	40-FT
3%	30-FT
4%	20-FT
5%	15-FT

TEMPORARY STRAW BALE CHECK DAM

DETAIL 7 / ES-2

NOT TO SCALE

REV. NO.	DATE	DRWN	CHKD	REMARKS
4	3/2023	JRH	NEJ	UPDATED FOR BIDDING
3	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE / DPW MATERIALS HANDLING AREA
2	4/2017	JRH	NEJ	REVISED TO RESPOND TO COMMENTS FROM THE U.S. ARMY CORPS. OF ENGINEERS
1	3/2017	NEJ	MHL	REVISED TO RESPOND TO CONSERVATION COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY: N. JONES
DRAWN BY: J. HEIL
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: MARCH 2023

CDM Smith
75 State Street, Suite 701
Boston, MA 02109
Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

EROSION AND SEDIMENTATION CONTROL DETAILS

PROJECT NO. 0235-113811
FILE NAME: ES02ESDT.DWG

SHEET NO.
ES-2

XREFs: [CDMS_2436] Images: [ConstructionMat_Stamp 2022.11.01]
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APPROXIMATE LIMITS OF VERNAL POOL #4

APPROXIMATE LIMITS OF VERNAL POOL #5

FLARED END SECTION INV = 166.0 (2/D-5)

PLACE 12" LAYER HIGH ORGANIC CONTENT LOAM OVER EXPOSED SECTIONS OF PIPE – RESTORE BVW BANK PER DETAIL (6/ES-2)

VERNAL POOL #1

PERMANENT ALTERATION TO BVW AREA: 540 SQUARE FEET

VERNAL POOL #2

GRASS STORMWATER SWALE (TYP.) SLOPE APPROX. 1% (1/D-3)

NON-JURISDICTIONAL STATE/LOCAL ISOLATED WETLANDS

(2/D-4) SPILLWAY (WIDTH VARIES)

(3/D-5) OUTLET CONTROL STRUCTURE

(1/D-6) CHECK DAM AT FOREBAY

NON-JURISDICTIONAL STATE/LOCAL ISOLATED WETLANDS

REVISED TREELINE (TYP.)

NORTH STORMWATER BASIN

(1/D-4) RIPRAP PAD

MATCH LINE C-17

MATCH LINE – C-15

BENCHMARK: TBM-1
RAIL ROAD SPIKE 0.02FT 1' ABOVE GRADE IN UTILITY POLE #3226-90.
ELEVATION = 193.28'

BENCHMARK: TBM-2
RAIL ROAD SPIKE SET 1' ABOVE GRADE IN BACK STOP.
ELEVATION = 190.36'

50 FT NO DISTURB
75 FT NO BUILD
100 FT BUFFER

100-FT BUFFER ZONE TO VERNAL POOL
75-FT BUFFER ZONE TO VERNAL POOL

PROPERTY LINE
PROJECT LIMITS
EDGE OF CAP
CHANDLER ROAD
ATHLETIC FIELD
CONCESSION STAND
BASEBALL LIGHT POST
BATTING CAGE
209.85
209.95
210.0
DUGOUT
BENCH
SCORE BOARD
JERSEY BARRIERS
GRASS ISLAND
GRAVEL
BIT
STONE WALL
FENCE
PILE
DMH – NO RIM
I(A)=156.60 12"ASB
I(B)=156.37 12"ASB
RIM = 162.69
IA=156.60 12"ASB
IB=156.37 12"ASB
157.06 INV OUT 12 RCP
157.10 INV OUT 12" RCP
NO RIM 12"ASB

PROPOSED LEGEND

- RIPRAP
- 196.6 + FINAL SPOT ELEVATION
- 188 FINAL CONTOUR
- PROJECT LIMITS
- EDGE OF LANDFILL CAP

1" = 40'
20 0 40

XREFs: [CDM_2436, CDMS_2436, Wetland Survey.dwg – WSP 9.2.15, Final_Grading-Working, Full Site Survey Revised 5.11.16, C001GRPL] Images: []
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REV. NO.	DATE	DRWN	CHKD	REMARKS
3	3/2023	JRH	NEJ	UPDATED FOR BIDDING
2	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE / DPW MATERIALS HANDLING AREA
1	4/2017	JRH	NEJ	REVISED TO RESPOND TO CONSERVATON COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY: G. HOWARD
DRAWN BY: J. HEIL
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: MARCH 2023

CDM Smith
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Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

FINAL GRADING AND DRAINAGE PLAN (SHEET 1 OF 4)

PROJECT NO. 0235-113811
FILE NAME: C014GDPL.DWG

SHEET NO.
C-14

MATCH LINE – C–14

MATCH LINE C–16

5 / D–3 RIPRAP STORMWATER SWALE SLOPE APPROX. 3%

REVISED TREELINE (TYP.)

3 / D–3 DOUBLE LINED WETLAND BASIN– SEE SHEET C–11 FOR LIMITS

PERMANENT ALTERATION TO IWW/ILSF AREA: 22,300 SQUARE FEET

NON–JURISDICTIONAL STATE/LOCAL ISOLATED WETLANDS

2 / D–3 SOUTHERN BASIN AND ACCESS DRIVE

BENCHMARK: TBM–3
LARGE MAG NAIL SET IN BASE OF 24" OAK TREE.
ELEVATION = 175.51'

BENCHMARK: TBM–6
RAIL ROAD SPIKE SET IN BASE OF UTILITY POLE #4760.
ELEVATION = 172.55'

PROPOSED LEGEND

- RIPRAP
- 196.6 + — FINAL SPOT ELEVATION
- 188 — FINAL CONTOUR
- PROJECT LIMITS
- EDGE OF LANDFILL CAP

NOTE: FOR EXISTING CONDITIONS NOTES AND LEGEND, SEE SHEET G–2.

1" = 40'
20 0 40

REV. NO.	DATE	DRWN	CHKD	REMARKS
3	3/2023	JRH	NEJ	UPDATED FOR BIDDING
2	11/2022	KAR	NEJ	REMOVED POST–CLOSURE USE / DPW MATERIALS HANDLING AREA
1	4/2017	JRH	NEJ	REVISED TO RESPOND TO CONSERVATON COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY: G. HOWARD
DRAWN BY: J. HEIL
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: MARCH 2023

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75 State Street, Suite 701
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Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

FINAL GRADING AND DRAINAGE PLAN (SHEET 2 OF 4)

PROJECT NO. 0235–113811
FILE NAME: C015GDPL.DWG
SHEET NO. C–15

XREFs: [CDMS_2436, Wetland Survey Dwg – WSP 9.2.15, Final_Grading–Working, Full Site Survey Revised 5.11.16, C0016RPL, 16365–CS–BN] Images: []
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MATCH LINE – C–17

MATCH LINE C–15

PROPOSED LEGEND

- WETLAND IMPACT AREAS
- RIPRAP
- WETLAND REPLICATION AREA
- 196.6 + FINAL SPOT ELEVATION
- 188 FINAL CONTOUR
- PROJECT LIMITS
- EDGE OF LANDFILL CAP

NOTE: FOR EXISTING CONDITIONS NOTES AND LEGEND, SEE SHEET G–2.

WETLAND REPLICATION AREA (D–6)

PERMANENT ALTERATION TO BVW, LUW AND BANK
BVW AREA: 1,250 SQUARE FEET
LUW AREA: 3,450 SQUARE FEET
BANK IMPACTS: 190 LINEAR FEET

PERMANENT ALTERATION TO BANK: 48 LF

HDPE FLARED END SECTION (2/D–6) INV. = 158.0

DETENTION DRAIN (4/D–3)

BENCHMARK: TBM–5
RAILROAD SPIKE, SET IN BASE OF 18" PINE TREE.
ELEVATION = 154.32'

BENCHMARK: TBM–4
RAILROAD SPIKE SET IN BASE OF 14" OAK TREE.
ELEVATION = 162.54'

100 FT BUFFER
75 FT NO BUILD
50 FT NO DISTURB
NO BUILD
NO DISTURB
50'
75'
PROJECT LIMITS
EDGE OF CAP
PROPERTY LINE
50 FOOT WIDE DRAIN EASEMENT (BOOK 1191, PAGE 656)
PETTINGELL AVENUE
STREAM
OBSCURED
BUILDING
DECK
WALK
BIT
GATE
STONE WALL
DMH RIM=154.65 I(A)=150.90 I(B)=150.90
CB RIM=163.37 I(A)=159.17 I(B)=159.17
INV=148.12 24"CMP
INV=145.53 12"CI
INV=146.00 12"CI
INV=144.78 15"RCP
INV=125.13 12"RCP
FES2
FES4
#5
#6
#7
#170

(1/D–3) GRASS STORMWATER SWALE (TYP.) SLOPE APPROX. 1%

REVISED TREELINE (TYP.)

(2/D–3) DOUBLE LINED BASIN– SEE SHEET C–12 FOR LIMITS

NON–JURISDICTIONAL STATE/LOCAL ISOLATED WETLANDS

(2/D–4) SPILLWAY (WIDTH VARIES)

(1/D–6) CHECK DAM AT FOREBAY

(3/D–6) OUTLET CONTROL STRUCTURE

EXTEND PIPE ONTO LANDFILL PROPERTY AND INSTALL RCP FLARED END SECTION (SEE SHEET C–29)

1" = 40'
20 0 40

REV. NO.	DATE	DRWN	CHKD	REMARKS
3	3/2023	JRH	NEJ	UPDATED FOR BIDDING
2	11/2022	KAR	NEJ	REMOVED POST–CLOSURE USE / DPW MATERIALS HANDLING AREA
1	3/2017	NEJ	MHL	REVISED TO RESPOND TO CONSERVATION COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY: G. HOWARD
DRAWN BY: J. HEIL
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: MARCH 2023

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TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

FINAL GRADING AND DRAINAGE PLAN (SHEET 3 OF 4)

PROJECT NO. 0235–113811
FILE NAME: C016GDPL.DWG
SHEET NO. C-16

XREFs: [CDMS_2436, Wetland Survey Dwg – WSP 9.2.15, Final_Grading–Working, Full Site Survey Revised 5.11.16, C001GRPL, 16365–CS–BN] Images: []
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OVERHEAD TRANSMISSION LINES

APPROXIMATE LIMIT OF VERNAL POOL #5

150 FOOT WIDE UTILITY EASEMENT (BOOK 538, PAGE 104)

PROPERTY LINE

STREAM

STONE WALL

OBSCURED

PLACE 12" LAYER HIGH ORGANIC CONTENT LOAM OVER EXPOSED SECTIONS OF PIPE – RESTORE BVW BANK PER DETAIL 6/ES-2

PROJECT LIMITS

5' CHAIN LINK FENCE

100 FT BUFFER

75 FT NO BUILD

50 FT NO DISTURB

100-FT BUFFER ZONE TO VERNAL POOL

75-FT BUFFER ZONE TO VERNAL POOL

WETLAND FLAG SERIES 3

TOP OF BANK SERIES 13

EDGE OF CAP

MATCH LINE C-14

MATCH LINE – C-16

PERMANENT ALTERATION BVW AREA: 1,350 SQUARE FEET

FINAL TREELINE (TYP.)

1/D-3 GRASS STORMWATER SWALE (TYP.) SLOPE APPROX. 1%

PROPOSED LEGEND

- WETLAND IMPACT AREAS
- 196.6 + — FINAL SPOT ELEVATION
- 188 — FINAL CONTOUR
- PROJECT LIMITS
- EDGE OF LANDFILL CAP

NOTE: FOR EXISTING CONDITIONS NOTES AND LEGEND, SEE SHEET G-2.

1" = 40'
20 0 40

REV. NO.	DATE	DRWN	CHKD	REMARKS
2	3/2023	JRH	NEJ	UPDATED FOR BIDDING
1	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE / DPW MATERIALS HANDLING AREA

DESIGNED BY: G. HOWARD
DRAWN BY: J. HEIL
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: MARCH 2023

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TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

FINAL GRADING AND DRAINAGE PLAN (SHEET 4 OF 4)

PROJECT NO. 0235-113811
FILE NAME: C017GDPL.DWG

SHEET NO.
C-17

APPENDIX A

NOTICE OF INTENT

APPENDIX B

INSPECTION REPORT (BLANK)

Project Name: _____
NPDES ID Number: _____

Section A – General Information (If necessary, complete additional inspection reports for each separate inspection location.)	
Inspector Information	
Inspector Name:	**Title:**
Company Name:	**Email:**
Address:	**Phone Number:**
Inspection Details	
Inspection Date:	**Inspection Location:**
Inspection Start Time:	**Inspection End Time:**
Current Phase of Construction:	**Weather Conditions During Inspection:**

Did you determine that any portion of your site was unsafe for inspection per CGP Part 4.5? ☐ Yes ☐ No

If "Yes," provide the following information:

Location of unsafe conditions:

The conditions that prevented you inspecting this location:

Indicate the required inspection frequency: (Check all that apply. You may be subject to different inspection frequencies in different areas of the site.)

Standard Frequency (CGP Part 4.2):

☐ At least once every 7 calendar days; **OR**

☐ Once every 14 calendar days *and* within 24 hours of the occurrence of either:

- A storm event that produces 0.25 inches or more of rain within a 24-hour period, or
- A snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period

Increased Frequency (CGP Part 4.3.1) (If site discharges to sediment or nutrient-impaired waters or to waters designated as Tier 2, Tier 2.5, or Tier 3):

☐ Once every 7 calendar days *and* within 24 hours of the occurrence of either:

- A storm event that produces 0.25 inches or more of rain within a 24-hour period, or
- A snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period

Reduced Frequency (CGP Part 4.4):

- ☐ For stabilized areas: Twice during first month, no more than 14 calendar days apart; then once per month after first month until permit coverage is terminated
- ☐ For stabilized areas on "linear construction sites": Twice during first month, no more than 14 calendar days apart; then once more within 24 hours of the occurrence of either:
  - A storm event that produces 0.25 inches or more of rain within a 24-hour period, or
  - A snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period
- ☐ For arid, semi-arid, or drought-stricken areas during seasonally dry periods or during drought: Once per month and within 24 hours of the occurrence of either:
  - A storm event that produces 0.25 inches or more of rain within a 24-hour period, or
  - A snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period
- ☐ For frozen conditions where construction activities are being conducted: Once per month

Was this inspection triggered by a storm event producing 0.25 inches or more of rain within a 24-hour period? ☐ Yes ☐ No

If "Yes," how did you determine whether the storm produced 0.25 inches or more of rain?

- ☐ On-site rain gauge
- ☐ Weather station representative of site.
  Weather station location:

Total rainfall amount that triggered the inspection (inches):

Was this inspection triggered by a snowmelt discharge from a storm event producing 3.25 inches or more of snow within a 24-hour period? ☐ Yes ☐ No

If "Yes," how did you determine whether the storm produced 3.25 inches or more of snow?

- ☐ On-site rain gauge
- ☐ Weather station representative of site.
  Weather station location:

Total snowfall amount that triggered the inspection (inches):

Section B – Condition and Effectiveness of Erosion and Sediment (E&S) Controls (CGP Part 2.2) (Insert additional rows if needed)					
Type and Location of E&S Control	**Conditions Requiring Routine Maintenance?[1]**	**If "Yes," How Many Times (Including This Occurrence) Has This Condition Been Identified?**	**Conditions Requiring Corrective Action?[2, 3]**	**Date on Which Condition First Observed (If Applicable)?**	**Description of Conditions Observed**
1.	☐ Yes ☐ No		☐ Yes ☐ No		
2.	☐ Yes ☐ No		☐ Yes ☐ No		
3.	☐ Yes ☐ No		☐ Yes ☐ No		
4.	☐ Yes ☐ No		☐ Yes ☐ No		
5.	☐ Yes ☐ No		☐ Yes ☐ No		
If the same routine maintenance was found to be necessary three or more times for the same control at the same location (including this occurrence), follow the corrective action requirements and record the required information in your corrective action log, or describe here why you believe the specific condition should still be addressed as routine maintenance:					

[1] Routine maintenance includes minor repairs or other upkeep performed to ensure that the site's stormwater controls remain in effective operating condition, not including significant repairs or the need to install a new or replacement control. Routine maintenance is also required for specific conditions: (1) for perimeter controls, whenever sediment has accumulated to half or more the above-ground height of the control (CGP Part 2.2.3.c.i); (2) where sediment has been tracked-out from the site onto paved roads, sidewalks, or other paved areas (CGP Part 2.2.4.d); (3) for inlet protection measures, when sediment accumulates, the filter becomes clogged, and/or performance is compromised (CGP Part 2.2.10.b); and (4) for sediment basins, as necessary to maintain at least half of the design capacity of the basin (CGP Part 2.2.12.f)

[2] Corrective actions are triggered only for specific conditions (CGP Part 5.1):

1. A stormwater control needs a significant repair or a new or replacement control is needed, or, in accordance with Part 2.1.4.c, you find it necessary to repeatedly (i.e., three (3) or more times) conduct the same routine maintenance fix to the same control at the same location (unless you document in your inspection report under Part 4.7.1.c that the specific reoccurrence of this same problem should still be addressed as a routine maintenance fix under 2.1.4); or
2. A stormwater control necessary to comply with the requirements of this permit was never installed, or was installed incorrectly; or
3. Your discharges are not meeting applicable water quality standards; or
4. A prohibited discharge has occurred (see CGP Part 1.3); or
5. During the discharge from site dewatering activities:
   a. The weekly average of your turbidity monitoring results exceeds the 50 NTU benchmark (or alternate benchmark if approved by EPA pursuant to Part 3.3.2.b); or
   b. You observe or you are informed by EPA, State, or local authorities of the presence of the conditions specified in Part 4.6.3.e.

[3] If a condition on your site requires a corrective action, you must also fill out a corrective action log found at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates. See CGP Part 5.4 for more information.

Project Name: _____
NPDES ID Number: _____

Section C – Condition and Effectiveness of Pollution Prevention (P2) Practices and Controls (CGP Part 2.3) (Insert additional rows if needed)					
Type and Location of P2 Practices and Controls	**Conditions Requiring Routine Maintenance?[1]**	**If "Yes," How Many Times (Including This Occurrence) Has This Condition Been Identified?**	**Conditions Requiring Corrective Action?[2, 3]**	**Date on Which Condition First Observed (If Applicable)?**	**Description of Conditions Observed**
1.	☐ Yes ☐ No		☐ Yes ☐ No		
2.	☐ Yes ☐ No		☐ Yes ☐ No		
3.	☐ Yes ☐ No		☐ Yes ☐ No		
4.	☐ Yes ☐ No		☐ Yes ☐ No		
5.	☐ Yes ☐ No		☐ Yes ☐ No		
If the same routine maintenance was found to be necessary three or more times for the same control at the same location (including this occurrence), follow the corrective action requirements and record the required information in your corrective action log, or describe here why you believe the specific condition should still be addressed as routine maintenance:					

Section D – Stabilization of Exposed Soil (CGP Part 2.2.14) (Insert additional rows if needed)					
Specific Location That Has Been or Will Be Stabilized	**Stabilization Method and Applicable Deadline**	**Stabilization Initiated?**	**Final Stabilization Criteria Met?**	**Final Stabilization Photos Taken?**	**Notes**
1.		☐ Yes ☐ No If "Yes," date initiated:	☐ Yes ☐ No If "Yes," date criteria met:	☐ Yes ☐ No	
2.		☐ Yes ☐ No If "Yes," date initiated:	☐ Yes ☐ No If "Yes," date criteria met:	☐ Yes ☐ No	
3.		☐ Yes ☐ No If "Yes," date initiated:	☐ Yes ☐ No If "Yes," date criteria met:	☐ Yes ☐ No	
4.		☐ Yes ☐ No If "Yes," date initiated:	☐ Yes ☐ No If "Yes," date criteria met:	☐ Yes ☐ No	
5.		☐ Yes ☐ No If "Yes," date initiated:	☐ Yes ☐ No If "Yes," date criteria met:	☐ Yes ☐ No	

Section E – Description of Discharges (CGP Part 4.6.2) (Insert additional rows if needed)	
Was a discharge (not including dewatering) occurring from any part of your site at the time of the inspection?[4] ☐ Yes ☐ No **If "Yes," for each point of discharge, document the following:** • The visual quality of the discharge. • The characteristics of the discharge, including color; odor; floating, settled, or suspended solids; foam; oil sheen; and other indicators of stormwater pollutants. • Signs of the above pollutant characteristics that are visible from your site and attributable to your discharge in receiving waters or in other constructed or natural site drainage features.	
Discharge Location	**Observations**
1.	
2.	
3.	
4.	
5.	

[4] If a dewatering discharge was occurring, you must conduct a dewatering inspection pursuant to CGP Part 4.3.2 and complete a separate dewatering inspection report.

Section F – Signature and Certification (CGP Part 4.7.2)	
"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."	
MANDATORY: Signature of Operator or "Duly Authorized Representative:"	
Signature:	**Date:**
Printed Name:	**Affiliation:**
OPTIONAL: Signature of Contractor or Subcontractor	
Signature:	**Date:**
Printed Name:	**Affiliation:**

General Tips for Using This Template

This Site Inspection Report Template is provided to assist you in preparing site inspection reports for EPA's 2022 Construction General Permit (CGP). If you are covered under the 2022 CGP, you can use this template to create a site inspection report form that is customized to the specific circumstances of your site and that complies with the minimum reporting requirements of Part 4.7 of the permit. Note that the use of this form is optional; you may use your own site inspection report form provided it includes the minimum information required in Part 4.7 of the CGP.

This template does not address the CGP's inspection reporting requirements related to dewatering activities. A separate inspection template has been developed specifically for dewatering activities and is available at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates.

Keep in mind that this document is a template and not an "off-the-shelf" inspection report that is ready to use without some modification. You must first customize this form to include the specifics of your project in order for it to be useable for your inspection reports. Once you have entered all of your site-specific information into the blank fields, you may use this form to complete inspection reports.

The following tips for using this template will help you ensure that the minimum permit requirements are met:

- **Review the inspection requirements.** Before you start developing your inspection report form, read the CGP's Part 4 inspection requirements. This will ensure that you have a working understanding of the permit's underlying inspection requirements.
- **Complete all required blank fields.** Fill out all blank fields. Only by filling out all fields will the template be compliant with the requirements of the permit. (Note: Where you do not need the number of rows provided in the template form for your inspection, you may delete these or cross them off as you see fit. Or, if you need more space to document your findings, you may insert additional rows in the electronic version of this form or use the bottom of the page in the field version of this form.)
- **Use your site map to document inspection findings.** In several places in the template, you are directed to specify the location of certain features of your site, including where stormwater controls are installed and where you will be stabilizing exposed soil. You are also asked to fill in location information for unsafe conditions and the locations of any discharges occurring during your inspections. Where you are asked for location information, EPA encourages you to reference the point on your SWPPP site map that corresponds to the requested location on the inspection form. Using the site map as a tool in this way will help you conduct efficient inspections, will assist you in evaluating problems found, and will ensure proper documentation.
- **Complete the inspection report within 24 hours of completing a site inspection.** You must complete an inspection report in accordance with Part 4.7.1 of the CGP.
- **Include the inspection form with your SWPPP.** Once your form is complete, make sure to include a copy of the inspection form in your SWPPP in accordance with Part 7.2.7.e of the CGP.
- **Retain copies of all inspection reports with your records.** You must also retain in your records copies of all inspection reports in accordance with the requirements in Part 4.7.3 of the CGP. These reports must be retained for at least 3 years from the date your permit coverage expires or is terminated in accordance with the requirements in Part 4.7.4 of the CGP.

Instructions for Section A

Inspector Name

Enter the name of the person that conducted the inspection. Include the person's contact information (title, affiliated company name, address, email, and phone number).

Inspection Date and Time

Enter the date you performed the inspection and the time you started and ended the inspection.

Weather Conditions During Inspection

Enter the weather conditions occurring during the inspection, e.g., sunny, overcast, light rain, heavy rain, snowing, icy, windy.

Current Phase of Construction
If this project is being completed in more than one phase, indicate which phase it is currently in.

Inspection Location
If your project has multiple locations where you conduct separate inspections, specify the location where this inspection is being conducted. If only one inspection is conducted for your entire project, enter "Entire Site." If necessary, complete additional inspection report forms for each separate inspection location.

Unsafe Conditions for Inspection (CGP Part 4.5.7)
Inspections are not required where a portion of the site or the entire site is subject to unsafe conditions. These conditions should not regularly occur and should not be consistently present on a site. Generally, unsafe conditions are those that render the site (or a portion of it) inaccessible or that would pose a significant probability of injury to applicable personnel. Examples could include severe storm or flood conditions, high winds, and downed electrical wires.

If your site, or a portion of it, is affected by unsafe conditions during the time of your inspection, provide a description of the conditions that prevented you from conducting the inspection and what parts of the site were affected. If the entire site was considered unsafe, specify the location as "Entire Site."

Inspection Frequency
Check all the inspection frequencies that apply to your project. Note that you may be subject to different inspection frequencies in different areas of your site.

Inspection Triggered by a Storm Event
If you were required to conduct this inspection because of a storm event that produced 0.25 inches or more of rain within a 24-hour period, indicate whether you relied on an on-site rain gauge or a nearby weather station (and where the weather station is located). Also, specify the total amount of rainfall for this specific storm event.

If you were required to conduct this inspection because of a snowmelt discharge from a storm event that produced 3.25 inches or more of snow within a 24-hour period, then indicate whether you relied on an on-site measurement or a nearby weather station (and where the weather station is located). Also, specify the total amount of snowfall for this specific storm event.

Instructions for Section B

Type and Location of Erosion and Sediment (E&S) Controls
Provide a list of all erosion and sediment (E&S) controls that your SWPPP indicates will be installed and implemented at your site. This list must include at a minimum all E&S controls required by CGP Part 2.2. Include also any natural buffers established under CGP Part 2.2.1. Buffer requirements apply if your project's earth-disturbing activities will occur within 50 feet of a discharge to receiving water. You may group your E&S controls on your form if you have several of the same type of controls (e.g., you may group "Inlet Protection Measures," "Perimeter Controls," and "Stockpile Controls" together on one line), but if there are any problems with a specific control, you must separately identify the location of the control, whether routine maintenance or corrective action is necessary, and in the notes section you must describe the specifics about the problem you observed.

Conditions Requiring Routine Maintenance?
Answer "Yes" if the E&S control requires routine maintenance as defined in footnote 1 of this template. Note that in many cases, "Yes" answers are expected and indicate a project with an active operation and maintenance program. You should also answer "Yes" if work to fix the problem is still ongoing from the previous inspection, though necessary work must be initiated immediately and completed by the end of the next business day or within seven calendar days if documented in accordance with CGP Part 2.1.4.b.

If "Yes," How Many Times (Including this Occurrence) Has this Condition Been Identified?
Indicate how many times the routine maintenance has been required for the same control at the same location.

Conditions Requiring Corrective Action?
Answer "Yes" if you found any of the conditions listed in footnote 2 in this template to be present during your inspection (CGP Part 5.1). If you answer "Yes," you must take corrective action and complete a corrective action log, found at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates. You should also answer "Yes" if work to fix the problem from a previous inspection is still ongoing, though the operator must comply with the corrective action deadlines in CGP Part 5.2.

Date on Which Condition First Observed (If Applicable)?
Provide the date on which the condition that triggered the need for routine maintenance or corrective action was first identified. If the condition was just discovered during this inspection, enter the inspection date. If the condition is a carryover from a previous inspection, enter the original date of the condition's discovery.

Description of Conditions Observed
For each E&S control and the area immediately surrounding it, describe whether the control is properly installed and whether it appears to be working to minimize sediment discharge. Indicate also whether a new or modified control is necessary to comply with the permit. Describe any problem condition(s) you observed such as the following:

1. Failure to install or to properly install a required E&S control
2. Damage or destruction to an E&S control caused by vehicles, equipment, or personnel, a storm event, or other event
3. Mud or sediment deposits found downslope from E&S controls, including in receiving waters, or on nearby streets, curbs, or open conveyance channels
4. Sediment tracked out onto paved areas by vehicles leaving construction site
5. Noticeable erosion or sedimentation at discharge outlets or at adjacent streambanks or channels
6. Erosion of the site's sloped areas (e.g., formation of rills or gullies)
7. E&S control is no longer working due to lack of maintenance
8. Other incidents of noncompliance

Describe also why you think the problem condition(s) occurred as well as actions (e.g., routine maintenance or corrective action) you will take or have taken to fix the problem.

For buffer areas, make note of whether they are marked off as required, whether there are signs of construction disturbance within the buffer, which is prohibited under the CGP, and whether there are visible signs of erosion resulting from discharges through the area.

If routine maintenance or corrective action is required, briefly note the reason. If routine maintenance or corrective action has been completed, make a note of the date it was completed and what was done. *If corrective action is required, note that you will need to complete a separate corrective action log describing the condition and your work to fix the problem*.

Routine Maintenance Need Has Been Found to be Necessary Three (3) or More Times for the Same Control at the Same Location (Including this Occurrence)
If routine maintenance has been required three (3) or more times for the same control at the same location, the permit requires (CGP Part 2.1.4.c) you to fix the problem using the corrective action procedures in CGP Part 5 or to document why you believe the reoccurring problem can be addressed as a routine maintenance fix. If you believe the problem can continue to be fixed as routine maintenance, describe why you believe the specific condition should still be addressed as routine maintenance.

Instructions for Section C

Type and Location of Pollution Prevention (P2) Practices and Controls
Provide a list of all pollution prevention (P2) practices and controls that are implemented at your site. This list must include all P2 practices and controls required by CGP Part 2.3 and those that are described in your SWPPP.

Conditions Requiring Routine Maintenance?
Answer "Yes" if the P2 practice or control requires routine maintenance as defined in footnote 1of this template. Note that in many cases, "Yes" answers are expected and indicate a project with an active operation and maintenance program. You should also answer "Yes" if work to fix the problem is still ongoing

from the previous inspection, though necessary work must be initiated immediately and completed by the end of the next business day or within seven calendar days if documented in accordance with CGP Part 2.1.4.b.

If "Yes," How Many Times (Including this Occurrence) Has this Condition Been Identified?
Indicate how many times the routine maintenance has been required for the same practice or control at the same location.

Conditions Requiring Corrective Action?
Answer "Yes" if you found any of the conditions listed in footnote 2 in this template to be present during your inspection (CGP Part 5.1). If you answer "Yes," you must take corrective action and complete a corrective action log, found at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates. You should also answer "Yes" if work to fix the problem from a previous inspection is still ongoing, though the operator must comply with the corrective action deadlines in CGP Part 5.2.

Date on Which Condition First Observed (If Applicable)?
Provide the date on which the condition that triggered the need for maintenance or corrective action was first identified. If the condition was just discovered during this inspection, enter the inspection date. If the condition is a carryover from a previous inspection, enter the original date of the condition's discovery.

Description of Conditions Observed
For each P2 control and the area immediately surrounding it, describe whether the control is properly installed, and whether it appears to be working to minimize or eliminate pollutant discharges. Indicate also whether a new or modified control is necessary to comply with the permit. Describe any problem condition(s) you observed such as the following:

1. Failure to install or to properly install a required P2 control
2. Damage or destruction to a P2 control caused by vehicles, equipment, or personnel, or a storm event
3. Evidence of a spill, leak, or other type of pollutant discharge, or failure to have properly cleaned up a previous spill, leak, or other type of pollutant discharge
4. Spill response supplies are absent, insufficient, or not where they are supposed to be located
5. Improper storage, handling, or disposal of chemicals, building materials or products, fuels, or wastes
6. P2 control is no longer working due to lack of maintenance
7. Other incidents of noncompliance

Describe also why you think the problem condition(s) occurred as well as actions (e.g., routine maintenance or corrective action) you will take or have taken to fix the problem.

If routine maintenance or corrective action is required, briefly note the reason. If routine maintenance or corrective action has been completed, make a note of the date it was completed and what was done. *If corrective action is required, note that you will need to complete a separate corrective action log describing the condition and your work to fix the problem*.

Routine Maintenance Need Was Found to be Necessary Three (3) or More Times for the Same Control at the Same Location (Including this Occurrence)
If routine maintenance has been required three (3) or more times for the same control at the same location, the permit requires (CGP Part 2.1.4.c) you to fix the problem using the corrective action procedures in CGP Part 5 or to document why you believe the reoccurring problem can be addressed as a routine maintenance fix. If you believe the problem can continue to be fixed as routine maintenance, describe why you believe the specific condition should still be addressed as routine maintenance.

Instructions for Section D

Specific Location That Has Been or Will Be Stabilized
List all areas where soil stabilization is required to begin because construction work in that area has permanently stopped or temporarily stopped (i.e., work will stop for 14 or more days), and all areas where stabilization has been implemented (CGP Part 2.2.14).

Stabilization Method and Applicable Deadline
For each area, specify the method of stabilization (e.g., hydroseed, sod, planted vegetation, erosion control blanket, mulch, rock).

Specify also which of the following stabilization deadlines apply to this location:

1. 5 acres or less of land disturbance occurring at any one time at site: Complete no later than 14 calendar days after stabilization initiated.
2. More than 5 acres of land disturbance occurring at any one time at site: Complete no later than 7 calendar days after stabilization initiated.
3. Arid, semi-arid, and drought-stricken areas: See CGP Part 2.2.14.b.i.
4. Unforeseen circumstances: See CGP Part 2.2.14.b.ii.
5. Discharges to a sediment- or nutrient-impaired water or to a water identified as Tier 2, 2.5, or 3 for antidegradation purposes: Complete no later than 7 days after stabilization initiated.

Stabilization Initiated?
For each area, indicate whether stabilization has been initiated. If "Yes," then enter the date stabilization was initiated.

Final Stabilization Criteria Met?
For each area, indicate whether the final stabilization criteria in CGP Part 2.2.14.c have been met. If "Yes," then enter the date final stabilization criteria were met.

Final Stabilization Photos Taken?
Answer "Yes" if you have taken photos before and after meeting the stabilization criteria as required in CGP Part 8.2.1.a.

Notes
For each area where stabilization has been initiated, describe the progress that has been made and what additional actions are necessary to complete stabilization. Note the effectiveness of stabilization in preventing erosion. If stabilization has been initiated but not completed, make a note of the date it is to be completed. If stabilization has been completed, make a note of the date it was completed. If stabilization has not yet been initiated, make a note of the date it is to be initiated and the date it is to be completed.

Instructions for Section E

You are only required to complete this section if a discharge is occurring at the time of the inspection (CGP Part 4.6.2).

Was a discharge (not including dewatering) occurring from any part of your site at the time of the inspection?
During your inspection, examine all points of discharge from your site, and determine whether a discharge is occurring. If a dewatering discharge was occurring, you must conduct a dewatering inspection pursuant to CGP Part 4.3.2. If there is a discharge, answer "Yes" and complete the questions below regarding the specific discharge. If there is not a discharge, answer "No" and skip to the next page.

Discharge Location (Repeat as necessary if there are multiple points of discharge.)
Specify the location on your site where the discharge is occurring. The location may be an outlet from a stormwater control or constructed stormwater channel, a discharge into a storm sewer inlet, or a specific point on the site. Be as specific as possible; it is recommended that you refer to a precise point on your site map.

Observations
Document the visual quality of the discharge and take note of the characteristics of the stormwater discharge, including color; odor; floating, settled, or suspended solids; foam; oily sheen; and other indicators of stormwater pollutants. Also, document signs of these same pollutant characteristics that are visible from your site and attributable to your discharge in receiving waters or in other constructed or natural site drainage features.

Instructions for Section F

Each inspection report must be signed and certified to be considered complete (CGP Part 4.7.2).

Operator or "Duly Authorized Representative" – MANDATORY (CGP Appendix G Part G.11.2 and CGP Appendix H Section X)

At a minimum, the site inspection report must be signed by either (1) the person who signed the NOI, or (2) a duly authorized representative of that person. The following requirements apply:

If the signatory will be the person who signed the NOI for permit coverage, as a reminder, that person must be one of the following types of individuals:

- *For a corporation*: By a responsible corporate officer. For the purpose of this subsection, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
- *For a partnership or sole proprietorship*: By a general partner or the proprietor, respectively.
- *For a municipality, State, Federal, or other public agency*: By either a principal executive officer or ranking elected official. For purposes of this subsection, a principal executive officer of a Federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

If the signatory will be a duly authorized representative, the following requirements must be met:

- The authorization is made in writing by the person who signed the NOI (see above);
- The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and
- The signed and dated written authorization is included in the SWPPP. A copy must be submitted to EPA, if requested.

Sign, date and print your name and affiliation.

Contractor or Subcontractor - OPTIONAL

Where you rely on a contractor or subcontractor to complete the site inspection report, you should consider requiring the individual(s) to sign and certify each report. Note that this does not relieve you, the permitted operator, of the requirement to sign and certify the site inspection report as well. If applicable, sign, date, and print your name and affiliation.

Note

While EPA has made every effort to ensure the accuracy of all instructions contained in this template, it is the permit, not this template, that determines the actual obligations of regulated construction stormwater discharges. In the event of a conflict between this template and any corresponding provision of the CGP, you must abide by the requirements in the permit. EPA welcomes comments on this Site Inspection Report Template at any time and will consider those comments in any future revision. You may contact EPA for CGP-related inquiries at cgp@epa.gov

2022 Construction General Permit Dewatering Inspection Report

Project Name: _____
NPDES ID Number: _____

Section A – Dewatering Discharges (CGP Part 4.6.3) Complete this section within 24 hours of completing the inspection. (If necessary, complete additional inspection reports for each separate inspection location.)	
Inspector Information	
Inspector Name:	**Title:**
Company Name:	**Email:**
Address:	**Phone Number:**
Inspection Details	
Inspection Date:	**Inspection Location:**
Discharge Start Time:	**Discharge End Time:**
Rate of Discharge (gallons per day):	**Corrective Action Required?**[1] ☐ Yes ☐ No
Describe Indicators of Pollutant Discharge at Point of Dewatering Discharge:[1]	
Attach Photographs of: 1. Dewatering water prior to treatment by a dewatering control(s) and the final discharge after treatment; and 2. Dewatering control(s); and 3. Point of discharge to any receiving waters flowing through or immediately adjacent to the site and/or to constructed or natural site drainage features, storm drain inlets, and other conveyances to receiving waters.	

[1] If you observe any of the following indicators of pollutant discharge, you are required to take corrective action under Part 5.1.5.b:

- a sediment plume, suspended solids, unusual color, presence of odor, decreased clarity, or presence of foam; or
- a visible sheen on the water surface or visible oily deposits on the bottom or shoreline of the receiving water.

Project Name: _____
NPDES ID Number: _____

Section B – Signature and Certification (CGP Part 4.7.2)	
"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."	
MANDATORY: Signature of Operator or "Duly Authorized Representative:"	
Signature:	**Date:**
Printed Name:	**Affiliation:**
OPTIONAL: Signature of Contractor or Subcontractor	
Signature:	**Date:**
Printed Name:	**Affiliation:**

General Tips for Using This Template

This Dewatering Inspection Report Template is provided to assist you in preparing dewatering inspection reports for EPA's 2022 Construction General Permit (CGP). If you are covered under the 2022 CGP, you can use this template to create a dewatering inspection report form that complies with the minimum reporting requirements of Part 4.6.3 of the permit. Note that the use of this form is optional; you may use your own inspection report form provided it includes the minimum information required in Part 4.6.3 of the CGP.

This template is for dewatering inspections only. A separate site inspection report template that does not include dewatering inspections and complies with the minimum reporting requirements of Part 4.7 of the permit is available at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates.

If you are covered under a State CGP, this template may be helpful in developing a report that can be used for that permit; however, it will need to be modified to meet the specific requirements of that permit. If your permitting authority requires you to use a specific inspection report form, you should not use this form.

The following tips for using this template will help you ensure that the minimum permit requirements are met:

- **Review the inspection requirements.** Before you start developing your inspection report form, read the CGP's Part 4 inspection requirements. This will ensure that you have a working understanding of the permit's underlying inspection requirements.
- **Complete all required blank fields.** Fill out all blank fields. Only by filling out all fields will the template be compliant with the requirements of the permit. (Note: Where you do not need the number of rows provided in the template form for your inspection, you may delete these as you see fit. Or, if you need more space to document your findings, you may insert additional rows in the electronic version of this form or use the bottom of the page in the field version of this form.)
- **Use your site map to document inspection findings.** In several places in the template, you are directed to specify the location of certain features of your site, including where stormwater controls are installed and where you will be stabilizing exposed soil. You are also asked to fill in location information for unsafe conditions and the locations of any discharges occurring during your inspections. Where you are asked for location information, EPA encourages you to reference the point on your SWPPP site map that corresponds to the requested location on the inspection form. Using the site map as a tool in this way will help you conduct efficient inspections, will assist you in evaluating problems found, and will ensure proper documentation.
- **Include the inspection form with your SWPPP.** Once your form is complete, make sure to include a copy of the inspection form in your SWPPP in accordance with Part 7.2.7.e of the CGP.
- **Retain copies of all inspection reports with your records.** You must also retain copies of all inspection reports in your records in accordance with the requirements in Part 4.7.3 of the CGP. These reports must be retained for at least 3 years from the date your permit coverage expires or is terminated in accordance with the requirements in Part 4.7.4 of the CGP.

Instructions for Section A

Inspector Name

Enter the name of the person that conducted the inspection. Include the person's contact information (title, affiliated company name, address, email, and phone number).

Inspection Date

Enter the date you performed the inspection.

Inspection Location

If your project has multiple locations where you conduct separate dewatering inspections, specify the location where this inspection is being conducted. Otherwise, you can enter "dewatering operation."

Discharge Start and End Times

Enter the approximate time the dewatering discharge started and ended on the day of the inspection.

Rate of Discharge
Enter the rate of discharge in gallons per day on the day of inspection.

To estimate the approximate discharge rate on the day of dewatering inspection, one approach is to use the manufacturer's design pump rating for the pump model in use. For example, a pump rated at 164 gpm (gallons per minute) by the manufacturer can be assumed to be discharging at 164 gpm in most cases. To convert to gallons per day, multiply the rate in gpm by the ratio of minutes in one-day (1,440 minutes per day), resulting in a discharge rate of 236,160 gallons per day.

In cases where the dewatering discharge is being pumped over long distances or a substantial distance uphill, which will result in a reduced pump rate relative to manufacturer's specification, the operator may improve the accuracy of the estimate by estimating the time required to fill a container of a known volume. For example, if it takes 60 seconds to fill an empty 55-gallon barrel, the estimated discharge rate is 55 gpm, or 79,200 gallons per day.

Indicators of Pollutant Discharge
For the point of discharge, describe any observed sediment plume, suspended solids, unusual color, presence of odor, decreased clarity, or presence of foam; and/or a visible sheen on the water surface or visible oily deposits on the bottom or shoreline of the receiving water.

Corrective Action Required?
Answer "Yes" if during your inspection you found any of the conditions listed above in the instructions for the Indicators of Pollutant Discharge section. If you answer "Yes," you must take corrective action and complete a corrective action log, found at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates. Answer "No" if you did not observe any of the listed pollutant indicators.

Photographs
As required in CGP Part 8.2.1.a, attach photos of: (1) dewatering water prior to treatment by a dewatering control(s) and the final discharge after treatment; (2) the dewatering control(s); and (3) the point of discharge to any receiving waters flowing through or immediately adjacent to the site and/or to constructed or natural site drainage features, storm drain inlets, and other conveyances to receiving waters.

Instructions for Section B

Each inspection report must be signed and certified to be considered complete (CGP Part 4.7.2).

Operator or "Duly Authorized Representative" – MANDATORY (CGP Appendix G Part G.11.2 and CGP Appendix H Section X)
At a minimum, the dewatering inspection report must be signed by either (1) the person who signed the NOI, or (2) a duly authorized representative of that person. The following requirements apply:

If the signatory will be the person who signed the NOI for permit coverage, as a reminder, that person must be one of the following types of individuals:

- *For a corporation*: By a responsible corporate officer. For the purpose of this subsection, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
- *For a partnership or sole proprietorship*: By a general partner or the proprietor, respectively.

- *For a municipality, State, Federal, or other public agency*: By either a principal executive officer or ranking elected official. For purposes of this subsection, a principal executive officer of a Federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

If the signatory will be a duly authorized representative, the following requirements must be met:

- The authorization is made in writing by the person who signed the NOI (see above);
- The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and
- The signed and dated written authorization is included in the SWPPP. A copy must be submitted to EPA, if requested.

Sign, date and print your name and affiliation.

Contractor or Subcontractor - OPTIONAL

Where you rely on a contractor or subcontractor to complete the dewatering inspection report, you should consider requiring the individual(s) to sign and certify each report. Note that this does not relieve you, the permitted operator, of the requirement to sign and certify the dewatering inspection report as well. If applicable, sign, date, and print your name and affiliation.

Note

While EPA has made every effort to ensure the accuracy of all instructions contained in this template, it is the permit, not this template, that determines the actual obligations of regulated construction stormwater discharges. In the event of a conflict between this template and any corresponding provision of the CGP, you must abide by the requirements in the permit. EPA welcomes comments on this Dewatering Inspection Report Template at any time and will consider those comments in any future revision. You may contact EPA for CGP-related inquiries at cgp@epa.gov

APPENDIX C

CORRECTIVE ACTION REPORT

2022 CGP Corrective Action Log
Project Name: _____
NPDES ID Number: _____

Section A – Individual Completing this Log	
Name:	**Title:**
Company Name:	**Email:**
Address:	**Phone Number:**
Section B – Details of the Problem (CGP Part 5.4.1.a) Complete this section within 24 hours of discovering the condition that triggered corrective action.	
Date problem was first identified:	**Time problem was first identified**:
What site conditions triggered this corrective action? *(Check the box that applies. See instructions for a description of each triggering condition (1 thru 6).)* ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5a ☐ 5b ☐ 6	
Specific location where problem identified:	
Provide a description of the specific condition that triggered the need for corrective action and the cause (if identifiable):	
Section C – Corrective Action Completion (CGP Part 5.4.1.b) Complete this section within 24 hours after completing the corrective action.	
For site condition # 1, 2, 3, 4, or 6 (those not related to a dewatering discharge) confirm that you met the following deadlines (CGP Part 5.2.1):	
☐ Immediately took all reasonable steps to address the condition, including cleaning up any contaminated surfaces so the material will not discharge in subsequent storm events. **AND**	
☐ Completed corrective action by the close of the next business day, unless a new or replacement control, or significant repair, was required. **OR**	
☐ Completed corrective action within seven (7) calendar days from the time of discovery because a new or replacement control, or significant repair, was necessary to complete the installation of the new or modified control or complete the repair. **OR**	
☐ It was infeasible to complete the installation or repair within 7 calendar days from the time of discovery. Provide the following additional information: Explain why 7 calendar days was infeasible to complete the installation or repair:	
Provide your schedule for installing the stormwater control and making it operational as soon as feasible after the 7 calendar days:	

For site condition # 5a, 5b, or 6 (those related to a dewatering discharge), confirm that you met the following deadlines:

- ☐ Immediately took all reasonable steps to minimize or prevent the discharge of pollutants until a solution could be implemented, including shutting off the dewatering discharge as soon as possible depending on the severity of the condition taking safety considerations into account.
- ☐ Determined whether the dewatering controls were operating effectively and whether they were causing the conditions.
- ☐ Made any necessary adjustments, repairs, or replacements to the dewatering controls to lower the turbidity levels below the benchmark or remove the visible plume or sheen.

Describe any modification(s) made as part of corrective action: (Insert additional rows below if applicable)	**Date of completion:**	**SWPPP update necessary?**	**If yes, date SWPPP was updated:**
1.		☐ Yes ☐ No	
2.		☐ Yes ☐ No	

Section D - Signature and Certification (CGP Part 5.4.2)

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

MANDATORY: Signature of Operator or "Duly Authorized Representative:"	
Signature:	**Date:**
Printed Name:	**Affiliation:**
OPTIONAL: Signature of Contractor or Subcontractor	
Signature:	**Date:**
Printed Name:	**Affiliation:**

General Instructions

This Corrective Action Log Template is provided to assist you creating a corrective action log that complies with the minimum reporting requirements of Part 5.4 of the EPA's Construction General Permit (CGP). For each triggering condition on your site, you will need to fill out a separate corrective action log.

The entire form must be completed to be compliant with the requirements of the permit. (Note: In Section C, if you do not need the number of rows provided in the corrective action log, you may delete these or cross them off. Alternatively, if you need more space to describe any modifications, you may insert additional rows in the electronic version of this form or use the bottom of the page in the field version of this form.)

If you are covered under a State CGP, this template may be helpful in developing a log that can be used for that permit; however, you will likely need to modify this form to meet the specific requirements of any State-issued permit. If your permitting authority requires you to use a specific corrective action log, you should not use this template.

Instructions for Section A

Individual completing this form Enter the name of the person completing this log. Include the person's contact information (title, affiliated company name, address, email, and phone number).

Instructions for Section B

You must complete Section B within 24 hours of discovering the condition that triggered corrective action. (CGP Part 5.4)

When was the problem first discovered?
Specify the date and time when the triggering condition was first discovered.

What site conditions triggered this corrective action? (CGP Parts 5.1 and 5.3)
Check the box corresponding to the numbered triggering condition below that applies to your site.

1. A stormwater control needs a significant repair or a new or replacement control is needed, or, in accordance with Part 2.1.4c, you find it necessary to repeatedly (i.e., 3 or more times) conduct the same routine maintenance fix to the same control at the same location (unless you document in your inspection report under Part 4.7.1c that the specific reoccurrence of this same problem should still be addressed as a routine maintenance fix under Part 2.1.4);
2. A stormwater control necessary to comply with the requirements of this permit was never installed, or was installed incorrectly;
3. Your discharges are not meeting applicable water quality standards;
4. A prohibited discharge has occurred (see Part 1.3);
5. During discharge from site dewatering activities:
   a. The weekly average of your turbidity monitoring results exceeds the 50 NTU benchmark (or alternate benchmark if approved by EPA pursuant to Part 3.3.2b); or
   b. You observe or you are informed by EPA, State, or local authorities of the presence of any of the following at the point of discharge to a receiving water flowing through or immediately adjacent to your site and/or to constructed or natural site drainage features or storm drain inlets:
      - sediment plume
      - suspended solids
      - unusual color
      - presence of odor
      - decreased clarity
      - presence of foam
      - visible sheen on the water surface or visible oily deposits on the bottom or shoreline of the receiving water
6. EPA requires corrective action as a result of permit violations found during an inspection carried out under Part 4.8.

Provide a description of the problem (CGP Part 5.4.1.a)

Provide a summary description of the condition you found that triggered corrective action, the cause of the problem (if identifiable), and the specific location where it was found. Be as specific as possible about the location; it is recommended that you refer to a precise point on your site map.

Instructions for Section C

You must complete Section C within 24 hours after completing the correction action. (CGP Part 5.4)

Deadlines for completing corrective action for condition # 1, 2, 3, 4, or 6 (if not relating to a dewatering discharge) (CGP Part 5.2.1)
Check the box to confirm that you met the deadlines that apply to each triggering condition. You are always required to check the first box (i.e., Immediately took all reasonable steps to address the condition, including cleaning up any contaminated surfaces so the material will not discharge in subsequent storm events.). Only one of the next three boxes should be checked depending on the situation that applies to this corrective action.

Check the second box if the corrective action for this particular triggering condition does not require a new or replacement control, or a significant repair. These actions must be completed by the close of the next business day from the time of discovery of the condition.

Check the third box if the corrective action for this particular triggering condition requires a new or replacement control, or a significant repair. These actions must be completed by no later than seven calendar days from the time of discover of the condition.

Check the fourth box if the corrective action for this particular triggering condition requires a new or replacement control, or a significant repair, and if it is infeasible to complete the work within seven calendar days. Additionally, you will need to fill out the table below the checkbox that requires:

1. An explanation as to why it was infeasible to complete the installation or repair within seven calendar days of discovering the condition.
2. Provide the schedule you will adhere to for installing the stormwater control and making it operational as soon as feasible after the seventh day following discovery.

Note: Per Part 5.2.1.c, where these actions result in changes to any of the stormwater controls or procedures documented in your SWPPP, you must modify your SWPPP accordingly within seven calendar days of completing this work.

Deadlines for completing corrective action for condition # 5a, 5b, or 6 related to a dewatering discharge (CGP Part 5.2.2)
These deadlines apply to conditions relating to construction dewatering activities. Check the box to confirm that you met the deadlines that apply to each triggering condition. You are required to check all of the boxes in this section to indicate your compliance with the corrective action deadlines.

List of modification(s) to correct problem
Provide a list of modifications you completed to correct the problem.

Date of completion
Enter the date you completed the modification. The work must be completed by the deadline you indicated above.

SWPPP update necessary?
Check "Yes" or "No" to indicate if a SWPPP update is necessary consistent with Part 7.4.1.a in order to reflect changes implemented at your site. If "Yes," then enter the date you updated your SWPPP. The SWPPP updates must be made within seven calendar days of completing a corrective action. (CGP Part 5.2.1.c)

Instructions for Section D

Each corrective action log entry must be signed and certified following completion of Section D to be considered complete. (CGP Part 5.4.2)

Operator or "Duly Authorized Representative" – MANDATORY (CGP Appendix G Part G.11.2 and CGP Appendix H Section X)
At a minimum, the corrective action log must be signed by either (1) the person who signed the NOI, or (2) a duly authorized representative of that person. The following requirements apply:

If the signatory will be the person who signed the NOI for permit coverage, as a reminder, that person must be one of the following types of individuals:

- *For a corporation*: By a responsible corporate officer. For the purpose of this subsection, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
- *For a partnership or sole proprietorship*: By a general partner or the proprietor, respectively.
- *For a municipality, State, Federal, or other public agency*: By either a principal executive officer or ranking elected official. For purposes of this subsection, a principal executive officer of a Federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

If the signatory will be a duly authorized representative, the following requirements must be met:

- The authorization is made in writing by the person who signed the NOI (see above);
- The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and
- The signed and dated written authorization is included in the SWPPP. A copy must be submitted to EPA, if requested.

Sign, date and print your name and affiliation.

Contractor or Subcontractor - OPTIONAL
Where you rely on a contractor or subcontractor to complete this log and the associated corrective action, you should consider requiring the individual(s) to sign and certify each log entry. Note that this does not relieve you, the permitted operator, of the requirement to sign and certify the log as well. If applicable, sign, date, and print your name and affiliation.

Recordkeeping

Logs must be retained for at least 3 years from the date your permit coverage expires or is terminated. (CGP Part 5.4.4)

Keep copies of your signed corrective action log entries at the site or at an easily accessible location so that it can be made immediately available at the time of an on-site inspection or upon request by EPA. (CGP Part 5.4.3) Include a copy of the corrective action log in your SWPPP. (CGP Part 7.2.7.e)

Note

While EPA has made every effort to ensure the accuracy of all instructions contained in this template, it is the permit, not this template, that determines the actual obligations of regulated construction stormwater discharges. In the event of a conflict between this template and any corresponding provision of the CGP, you must abide by the requirements in the permit. EPA welcomes comments on this Corrective Action Log Template at any time and will consider those comments in any future revision. You may contact EPA for CGP-related inquiries at cgp@epa.gov

APPENDIX D

SWPPP AMENDMENT LOG

SWPPP Amendment Log

No.	Description of the Amendment	Date of Amendment	Amendment Prepared by [Name(s) and Title]

APPENDIX E

INSPECTION AND MONITORING GUIDE FOR CONSTRUCTION DEWATERING

EPA 833-B-22-001

Inspection and Monitoring Guide for Construction Dewatering

EPA's 2022 Construction General Permit

February 2022

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Section 1: Introduction

This guide describes how to conduct inspections and turbidity benchmark monitoring for discharges from construction dewatering activities. Its target audience is operators covered under EPA's 2022 Construction General Permit (CGP) who will be discharging dewatering water.

Authorized dewatering discharges under EPA's CGP

The CGP defines dewatering as "the act of draining accumulated stormwater and/or groundwater from building foundations, vaults, and trenches, or other similar points of accumulation" (CGP, Appendix A). The CGP includes **uncontaminated** construction dewatering water as an authorized (i.e., allowed) non-stormwater discharge, provided the operator satisfies the conditions specified in Part 2.4 of the CGP.

This guide does not impose any new legally binding requirements on EPA, States, Tribes, territories, or the regulated community; it does not confer legal rights or impose legal obligations upon any member of the public. In the event of a conflict between this document and any statute, regulation, or permit, this document would not be controlling.

Interested parties are free to raise questions and objections about this guide's substance, and about its applicability to a particular situation. EPA retains the discretion to adopt approaches on a case-by-case basis that differ from those described in this guide, where appropriate.

1.A Introduction to CGP Dewatering Inspection and Monitoring Requirements

The 2022 CGP established inspection and turbidity benchmark monitoring requirements for dewatering discharges. These include the following:

- **Dewatering inspections for all sites.** All sites discharging dewatering water must complete inspections of dewatering operations once per day on any day there is a dewatering discharge. Operators must check for signs of sediment or other visual indicators of pollution in dewatering discharges and take corrective action, when needed.
- **Turbidity benchmark monitoring for operators discharging to sensitive waters.** Operators that discharge dewatering water to sensitive waters must sample that dewatering water once per day for turbidity analysis. They must then compare the weekly average results with the assigned benchmark threshold. Where weekly average turbidity results exceed the benchmark, the operator must take corrective action.

Sensitive waters

The CGP defines "sensitive waters" as receiving waters listed as impaired for sediment or a sediment-related parameter, or receiving waters designated as a Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes. See CGP, Part 3.3.

- **State, Tribal, or territorial required monitoring.** Dewatering discharges may be subject to additional State-, Tribe-, or territory-specific requirements. Consult CGP, Part 9, to determine if you must conduct additional monitoring at each dewatering discharge point.

Section 2: Prepare for Inspection and Monitoring

Preparing to inspect and monitor dewatering discharges requires that you collect information about your construction site and your site's dewatering operations. Most of this information should have been collected previously, to be used in submitting a Notice of Intent (NOI) for coverage under the CGP and developing the monitoring procedures section of the site's stormwater pollution prevention plan (SWPPP).

You will need to compile the dewatering information if it has not already been developed. This guide suggests resources for doing so—for example, determining receiving waters and evaluating SWPPP site map components. Note that EPA has a suggested template for SWPPPs, the *Construction Stormwater Pollution Prevention Plan (SWPPP) Template*, available at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates.

2.A Determine Where Dewatering Discharges Are Occurring

What if my site does not discharge dewatering water?

The CGP does not require dewatering inspections or turbidity benchmark monitoring if dewatering water stays on-site. Retained water may, for instance, be allowed to evaporate or infiltrate into the soil (unless ground water contamination concerns exist as described in CGP, Part 2.2.2) or be used for on-site dust control, irrigation, or other construction-related purposes.

The following documents will direct you to the location(s) of dewatering discharges from your site, the first step toward planning for inspection of dewatering discharges and possible turbidity benchmark monitoring.

- A copy of the CGP and the accompanying fact sheet.
- A copy of the CGP NOI submitted to EPA. The NOI identifies the site's discharge points and receiving waters and indicates whether there will be a discharge of dewatering water.
- The SWPPP, which must include:
  - Procedures for dewatering inspection, maintenance, and corrective action (CGP, Part 7.2.7).
  - Procedures for turbidity benchmark monitoring from dewatering discharges, if applicable (CGP, Part 7.2.8).
  - A site map that:
    - Shows the location(s) of any receiving waters within the site and all receiving waters within 1 mile downstream of the site's discharge point(s) (CGP, Part 7.2.4.c).

Discharge point

For the purposes of the CGP, the discharge point is the location where concentrated stormwater flows or dewatering water are discharged from the construction site. See CGP, Appendix A.

- Identifies if any receiving waters are listed as impaired or identified as a Tier 2, Tier 2.5, or Tier 3 water (CGP, Part 7.2.4.c).
- Shows all discharge locations, as well as the location(s) where turbidity benchmark monitoring will take place, if applicable to your site (CGP, Part 7.2.4.g).

You should visit all dewatering operations and dewatering discharge points to verify the information in the SWPPP. For each dewatering operation, note:

- Whether ground water, accumulated stormwater, or a combination of the two is being dewatered. Ground water and stormwater have different potential pollutants.
- Whether the dewatering operation is continuous or intermittent and the expected frequency of dewatering discharges. Continuous dewatering may occur at sites with high ground water or alluvial aquifers, or when work is done next to receiving waters. Intermittent dewatering may occur during wet weather periods.
- Whether dewatering water is discharged to a municipal separate storm sewer system (MS4). If you discharge to an MS4, you should contact the operator of the system (e.g., the local public works department, the highway department) to alert them to the discharge.
- Whether the receiving water is a sensitive water.

You should consider taking photos of each dewatering operation and discharge point before commencing dewatering. You will later be able to use these initial photos as a baseline to identify erosion or other adverse impacts from dewatering.

Municipal separate storm sewer systems (MS4s)

An MS4 is "a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains)…Owned and operated by a…public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes…that discharges to waters of the United States" and is "Designed or used for collecting or conveying storm water; which is not a combined sewer; and which is not part of a Publicly Owned Treatment Works" [40 CFR 122.26(b)(8)].

2.B Determine Which CGP Requirements Apply at Each Dewatering Discharge Point

Daily Dewatering Inspections

All operators must inspect dewatering operations once per day when dewatering discharge is occurring (CGP, Part 4.3.2). Daily dewatering inspections are in addition to site inspections required by CGP Part 4.2.

Turbidity Benchmark Monitoring

You must carry out turbidity benchmark monitoring if you discharge dewatering water to sensitive waters (CGP, Part 3.3). You must collect at least one turbidity sample from each dewatering discharge point, each day a discharge occurs. Samples may be taken at any time during the day while dewatering water is being discharged. You may consider taking the daily turbidity sample while you conduct daily dewatering inspections.

What is turbidity?

The CGP defines turbidity as "a condition of water quality characterized by the presence of suspended solids and/or organic material" (CGP, Appendix A). Water with low turbidity appears clear; water with higher turbidity appears cloudy or murky.

Turbidity samples must be analyzed using a turbidity meter that reports results in nephelometric turbidity units (NTUs) and conforms with an EPA-approved method under 40 CFR Part 136 (e.g., EPA Method 180.1). Compare the turbidity level in each sample to the CGP turbidity benchmark threshold to determine if corrective action is required to reduce turbidity levels in dewatering discharges.

The turbidity benchmark threshold is 50 NTUs (referred to as the "standard 50 NTU benchmark"). However, if you can demonstrate that your receiving water's water quality standard for turbidity is higher than 50 NTUs, CGP Part 3.3.2.b describes a process to request EPA approval of a turbidity benchmark for your site that is higher than the standard 50 NTU benchmark.

Benchmarks as used in the CGP are not effluent limits. Instead, a benchmark acts as a trigger to require corrective action when the weekly average of turbidity monitoring results exceeds it. Corrective actions include steps such as shutting off the dewatering discharge, investigating whether dewatering controls are operating effectively and could be the cause of the exceedance, and adjusting the controls as needed to lower the turbidity levels below the benchmark. Corrective actions are described in more detail in Section 4.

What Is a Sensitive Water?

CGP Part 3.3 defines a "sensitive water" as a receiving water that is either or both of the following:

- Impaired for sediment or a sediment-related parameter. (An impaired water is a water that a State, a Tribe, or EPA identifies as not meeting water quality standards for a specific parameter.)
- Designated as a Tier 2, 2.5, or 3 water for antidegradation purposes.

Sediment-related parameters

The CGP defines a "sediment-related parameter" as a pollutant parameter that is closely related to sediment such as turbidity, total suspended solids, total suspended sediment, transparency, sedimentation, and siltation (CGP, Appendix A).

The Federal antidegradation policy at 40 CFR 131.12 requires different levels of protection, or "tiers," for waters of the United States. For antidegradation purposes, Tier 2 waters are those waters whose quality exceeds the levels needed to support propagation of fish, shellfish, and wildlife, as well as recreation in and on the water. Tier 3 waters are Outstanding Natural Resource Waters, such as waters of national and State parks and wildlife refuges and waters of exceptional recreational or ecological significance. Some States and Tribes designate Tier 2.5 high quality waters, which require a level of protection equal to or greater than Tier 2 waters, but less than that given to Tier 3 waters.

How Do I Know If I Am Discharging to a Sensitive Water?

If you filed an NOI to obtain CGP coverage, you will have already identified your receiving waters and whether they are impaired or designated as Tier 2, 2.5, or 3 waters.

Waters impaired for sediment and sediment-related parameters are identified on each State's Clean Water Act, Section 303(d) list—that is, the list of impaired and threatened waters (e.g., stream/river segments, lakes). States submit their 303(d) lists for EPA approval every 2 years.

For each water on the list, the State identifies the pollutant causing the impairment, when known (EPA, 2021).

EPA's Stormwater Discharge Mapping Tools publishes information on waterbody impairments by segment. You can also refer to the State's 303(d) list, but you will need to know the name of the waterbody and the segment identification number. EPA's How's My Waterway? webpage is useful for identifying which waterbody segment receives discharges from your construction site.

EPA's Construction General Permit Resources, Tools, and Templates webpage provides links to a list of currently designated Tier 2, Tier 2.5, and Tier 3 waters in the areas where the CGP is in effect. You should not assume that a water does not receive Tier 2, Tier 2.5, or Tier 3 protection solely based on the absence of information contained in this list. Contact your State or Tribal authority if you need help determining whether your site discharges to a Tier 2, Tier 2.5, or Tier 3 water.

2.C Determine Where You Will Collect Samples

If your site has one or more discharge points through which treated dewatering water flows to a sensitive receiving water, each of these dewatering discharges must be sampled and analyzed for turbidity each day a discharge occurs. As previously mentioned, the SWPPP site map must identify discharge points, receiving waters, and the specific turbidity sampling locations (CGP, Part 7.2.4.g).

The CGP does not prescribe an exact sampling location for turbidity benchmark monitoring; you are responsible for identifying a safe and accessible sampling location that is representative of the discharge. (A sample is representative if it has the same physical and chemical characteristics as the dewatering discharge.) CGP Part 3.3.1.b stipulates that "[s]amples must be taken after the dewatering water has been treated by installed treatment devices…and prior to its discharge off site into a receiving water, constructed or natural site drainage feature, or storm drain inlet"—that is, before the treated dewatering water commingles with stormwater or other pollutant sources.

Note that the sampling location for turbidity benchmark monitoring may be different than the discharge point based on the configuration of the dewatering operation. However, the sampling location for a particular discharge point should be the same from sample to sample unless adverse conditions prevent safe access.

Sampling from a Pipe or Hose

If dewatering water flows from the treatment control through a pipe or hose to the discharge point, take the sample directly from the pipe or hose. Typically, a cuvette is used to collect the sample and the same cuvette is used for the analysis. This avoids having to transfer the sample from the sampling container to the cuvette for analysis.

What is a cuvette?

A cuvette is a small tube-like container with straight sides and a circular or square cross section. It is sealed at one end, and made of a clear, transparent material such as plastic, glass, or fused quartz. Cuvettes hold the sample, and the turbidity meter passes a beam of light through the sample within the cuvette to measure turbidity.

For hard-to-reach locations, you may need to fasten a collection bottle to a pole. If you take the sample in a bottle or other container, you must transfer the sample to the cuvette for analysis. Before transferring the sample, gently agitate or mix it to keep solids in suspension while transferring. (Otherwise, the transfer process can cause a turbidity result that is artificially low

and is not representative of the discharge.) Take care when transferring to the cuvette to minimize formation of air bubbles, which can cause a turbidity result that is artificially high and is not representative of the discharge.

Sampling Overland Flow

In some areas of your site, it may be difficult to obtain a sample because the dewatering discharge drains overland flow and is not deep enough to collect a sample. If the flow is too shallow to directly fill a cuvette, consider:

- Concentrating overland flow by excavating a small depression in an existing ditch or other location where stormwater runoff flows.

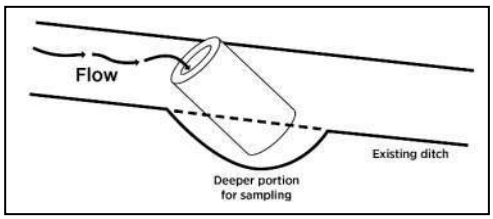

Figure 1. Sampling overland flow by deepening an existing ditch

- Installing a trough, gutter, or ditch to intercept and concentrate dewatering flow.

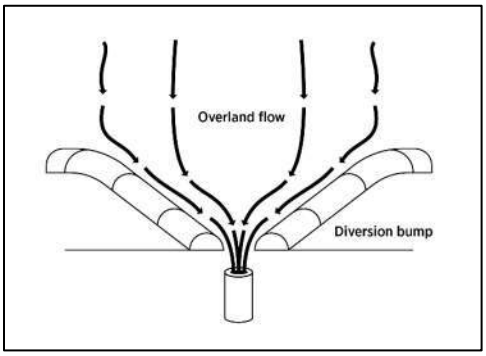

Figure 2. Sample overland flow from vegetated areas by constructing a shallow ditch to intercept the runoff and a deepened area to place bottles to catch the runoff.

- Installing "speed" bumps to convey and concentrate overland flow. A container positioned on the edge of the collection area can collect samples directly.

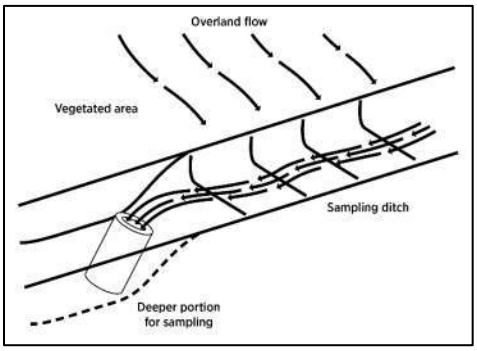

Figure 3. Sample overland flow by constructing diversion bumps to collect and concentrate the flow.

If you dig a ditch or disturb the earth in some way, line the disturbance with concrete or plastic to avoid contaminating stormwater samples with sediment or other pollutants.

Sampling from a Drainage Ditch or Swale

If dewatering water is discharged via a drainage ditch or vegetated swale, collect the sample from a consistently flowing part of the ditch/swale. If the ditch/swale is too small or shallow, install a barrier device in the channel or deepen a small area so you can sample directly into the bottles. If you dig a ditch or disturb the earth in some way, line the disturbance with concrete or plastic so that you do not contaminate your stormwater samples with sediment or other pollutants.

Sampling from a Stormwater Detention/Retention Basin

If you need to sample from a detention or retention basin, only do so at the structure's outlet and only when a discharge from the basin occurs. You are not required to conduct turbidity benchmark monitoring if the on-site basin that receives dewatering water is not discharging, but you should check the basin outlet for discharge every day dewatering is occurring. Note that if the basin receives other inflows in addition to dewatering water (e.g., stormwater), the discharge from the basin must still meet the turbidity benchmark.

Potential Sampling Issues

Potential problems for dewatering sampling include adverse weather and lack of accessibility.

- **Adverse weather.** High tides and high flow or flood conditions can make it difficult to reach the dewatering sampling location, pipes and hoses may be clogged or submerged, and dewatering treatment controls may be overloaded. You should use your best professional judgment when choosing sampling locations during adverse weather. In some cases, you may need to sample at a point before the discharge point.
- **Discharge point/sampling location is inaccessible.** Discharge points and sampling locations may not be accessible for a variety of reasons. In these instances, you may need to identify an alternate, representative sampling location. Go upstream of the dewatering sampling location until a sample can be taken. If you cannot collect a sample, make a note on your turbidity benchmark monitoring data table (see the sample in Appendix A) and take photos if possible.

2.D Select Dewatering Inspection and Monitoring Staff

Each operator, or group of multiple operators, covered under the CGP must have a "stormwater team" responsible for monitoring activities and corrective actions.[1] Section 6 of this guide provides an overview of training requirements and recommendations for stormwater team members who will inspect and monitor dewatering operations. It may be advantageous to have the person or persons performing dewatering inspections also conduct turbidity benchmark monitoring, when required. Using the same person or team for inspections and turbidity benchmark monitoring will help produce consistent, comparable samples over time.

Some permitted construction sites have one operator each; others may have multiple operators. Where multiple operators are operating on one site, they may coordinate representation on the stormwater team to avoid duplicating efforts (CGP, Part 3.3). CGP Part 7.2.8 requires that your

[1] Part 6.1 of the 2022 CGP lists which construction site staff must be represented on the stormwater team. Part 6.2 of the CGP lists the general training requirements for members of the stormwater team.

SWPPP describe any coordinating arrangement you may have with any other permitted operators on the same site for compliance with the turbidity benchmark monitoring requirements, including which parties have which specific responsibilities.

A written agreement is the best practice when stormwater compliance, monitoring, and corrective actions are shared among multiple operators. A written agreement that assigns specific monitoring responsibilities to specific members of the stormwater team, identified by operator and position, will help to make sure that dewatering inspection and turbidity benchmark monitoring activities are not missed because of communication breakdowns and will clarify each operator's monitoring responsibilities during a regulatory inspection.

2.E Select a Turbidity Meter That Meets EPA Requirements

Only purchase a turbidity meter that conforms with an EPA-approved method in 40 CFR Part 136 (e.g., EPA Method 180.1). This information should be readily available from the manufacturer or retailer.

Samples must be measured using a turbidity meter that reports results in NTUs. EPA-compliant (field or benchtop) turbidity meters comply with the methods outlined in 40 CFR Part 136. The most common approved method used for turbidity monitoring is *EPA Method 180.1: Determination of Turbidity by Nephelometry*, the standard for determining turbidity in drinking, ground, surface, waste, and seawater samples. The applicable range of EPA Method 180.1 is 0–40 NTUs, making it ideal for low-range samples. The method can be modified for higher levels of turbidity with dilution of the sample. EPA has approved other methods for turbidity.[2] Some methods are better suited for measuring higher or lower levels of turbidity; choose a method to reflect the expected level of turbidity of the dewatering discharge.

Things to look for when purchasing a turbidity meter include, but are not limited to:

- The meter complies with an approved EPA method. (This is usually highlighted by the manufacturer.)
- The meter is durable and weather-resistant if it will be used in the field.
- Calibration materials are readily available.

Potential issues with turbidity meters include:

- **Malfunctions**. If the turbidity meter malfunctions or fails to calibrate correctly, it should be repaired or recalibrated, or another sampling device should be used.
- **Turbidity sample exceeds the meter's range.** If the sample's turbidity level is outside the meter's range, refer to the manufacturer's manual. You may need to dilute the sample to obtain a result. *EPA Method 180.1: Determination of Turbidity by Nephelometry* describes how to dilute a sample to obtain a turbidity result.

[2] Standard Method 2130 B-2011, ASTM D1889-00, and USGS 1-3860-85 are also approved methods under 40 CFR Part 136.

2.F Document Dewatering Inspection and Monitoring Procedures in Your SWPPP

You must correctly document dewatering inspection and turbidity benchmark monitoring procedures in your SWPPP (CGP, Parts 7.2.7 and 7.2.8). If your site is required to conduct turbidity benchmark monitoring, the SWPPP must describe the procedures for collecting and evaluating samples, reporting results to EPA, keeping records of monitoring information, and taking corrective action when necessary. The SWPPP must identify the specific type of turbidity meter used for monitoring and all manuals or manufacturer instructions on how to operate and calibrate the meter (CGP, Part 7.2.8).

2.G Collect and Organize Inspection and Monitoring Supplies

You should make a list and collect all the supplies you will need for the required turbidity benchmark monitoring. These supplies should be stored and organized in a common location to ensure they are accessible when you need to sample. They include, but are not limited to:

- **Sampling equipment.** Ensure the turbidity meters are in working condition, calibration solutions are available and not expired, and that any other needed sampling materials (e.g., cuvettes, wipes, extra batteries) are stocked.
- **Personal protective equipment.** Hard hats, vests, safety glasses, etc., should be readily accessible on-site for inspection and monitoring activities.
- **Documentation**. Appendix A provides a sample turbidity benchmark monitoring data table.

Section 3: Conduct Inspections and Monitoring and Evaluate Results

This section addresses how to conduct dewatering inspections, perform turbidity benchmark monitoring of dewatering discharges (if required), and evaluate inspection observations and sampling results. The section covers inspection procedures, how to collect and analyze samples, and how to record the results. Recall that operators must inspect dewatering discharges every day these discharges are occurring. Turbidity benchmark monitoring must be performed every day discharges are occurring, but only for discharges to a sensitive water.

3.A Inspect Dewatering Operations

You must inspect dewatering operations once each day when dewatering water is being discharged to ensure that dewatering treatment controls are working correctly; to evaluate whether there are observable indicators of pollutant discharges; and, if so, to know whether you need to take action to correct any problems at the site or with the dewatering controls that may have contributed to the pollutant discharges. CGP Part 4.6.3.e identifies two general conditions to watch for during dewatering inspections, either of which would mean you must take corrective actions:

- A sediment plume, sheen, suspended solids, unusual color, presence of odor, decreased clarity, or presence of foam.
- A visible sheen or visible hydrocarbon or sediment deposits on the bottom or shoreline of the receiving water.

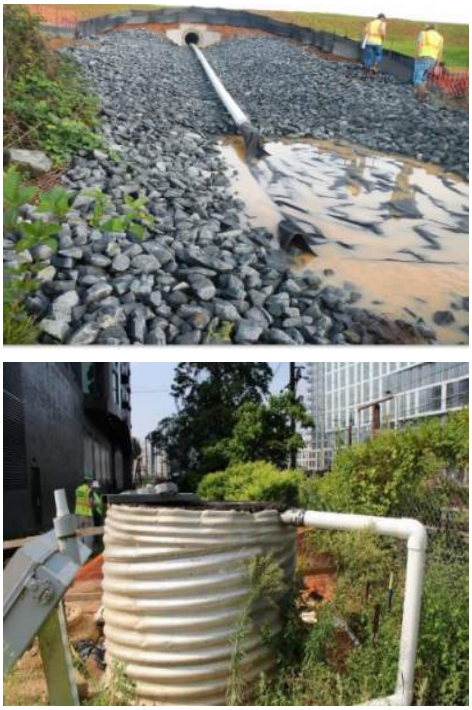

Figure 4. Dewatering discharge operations.

You should give special attention to the dewatering operation during initial setup, when the dewatering operation changes, and after major storm events. If you observe any of the pollutant indicators identified above during your inspection, you must conduct corrective action under CGP Parts 5.1.5.b and 5.2.2. Section 4 presents corrective actions to consider when you observe pollutant indicators in dewatering discharges.

CGP Part 4.6.3.f requires photo documentation of dewatering inspections. You must take photos of:

1. dewatering water prior to treatment by a dewatering control(s) and the final discharge after treatment;
2. the dewatering control(s); and

3. the point of discharge to any receiving waters flowing through or immediately adjacent to the site and/or to constructed or natural site drainage features, storm drain inlets, and other conveyances to receiving waters.

Field personnel will also need to estimate the rate of discharge, in gallons per day (gpd), if the dewatering treatment control does not have a flow gauge. Operators may rely on the manufacturer's design pump rating for the pump model in use. For example, a pump rated at 164 gallons per minutes (gpm) by the manufacturer can be assumed to be discharging at 164 gpm in most cases. To convert to gpd, multiply the rate in gpm by 1,440 (the number of minutes in one day), resulting in a daily discharge rate of 236,160 gallons.[3] If the dewatering discharge is being pumped over long distances or a substantial distance uphill—which will result in a pump rate lower than the manufacturer's specification—the operator may improve the accuracy of the estimate by estimating the time required to fill a container of a known volume. For example, if it takes 60 seconds to fill an empty 55-gallon barrel, the estimated discharge rate is 55 gpm, or 79,200 gpd.

Refer to Section 5.A of this guide for dewatering inspection recordkeeping requirements.

Operators not subject to turbidity benchmark monitoring can skip to Section 4.

3.B Collect and Analyze Turbidity Benchmark Monitoring Samples

The protocol below outlines the appropriate steps for collecting a grab sample for turbidity benchmark monitoring. A grab sample is a single sample obtained by filling up a container directly from the source. Always wear clean, disposable, powder-free gloves during sampling activities. To avoid sample contamination, dispose of the gloves after using them once. You should refer to the turbidity meter manufacturer's instructions for details on calibrating and using your meter.

Figure 5. Turbidity sample collected in a cuvette.

- Conduct a daily calibration verification consistent with the manufacturer's instructions.
- Fill the cuvette (or other sample container) directly from the sampling location. Make sure not to set its opening on the ground, or against the mouth of the discharge point, to avoid contaminating the sample.
- If you have used a different container to collect the sample, transfer the sample to the cuvette.
    - Gently agitate or mix the sample before transferring to keep the solids in suspension during the transfer.
    - Pour the sample onto the interior wall of the cuvette to avoid bubble formation.
- Wipe the outside of the cuvette with a clean cloth or tissue and gently agitate the sample to disperse the solids before inserting the turbidity meter.

[3] The example assumes that the site is dewatering 24 hours per day. If not, use the number of minutes the pump is operating each day to calculate the daily discharge.

- Run the meter and record the result in NTUs on the sampling form, as described in Section 3.C below.
- Empty the cuvette and other sampling container (if you used one). Rinse and dry them before collecting and analyzing another sample.

If you are taking multiple dewatering samples for analysis with a benchtop turbidity meter in the trailer, be sure to properly label the containers so the sample results can be matched to each sampling location.

3.C Record Information for Each Monitoring Event

You must keep records of the following information for each turbidity sample (CGP, Standard Condition G.10.3).

- The date, time, and exact location of the turbidity sample.
- The person(s) who performed the sampling and analyses.
- The analytical techniques or methods used. For this, it is sufficient to record the make and model of the turbidity meter.
- The date and time each sample was analyzed. Note that sampling and analysis times may be the same if using a field meter, or they may be different if samples are collected and taken to a different location for analysis, such as a benchtop turbidity meter in the trailer, office, or elsewhere nearby. 40 CFR Part 136 specifies that turbidity samples must be analyzed within 48 hours of collection, which is the maximum holding time.
- The turbidity result for each sample. The CGP requires turbidity monitoring results to be rounded to the nearest whole number.

Record the required information on your monitoring data table (a sample table is provided in Appendix A).

3.D Evaluate Turbidity Benchmark Monitoring Results

The analysis of your turbidity benchmark monitoring results will determine if you must perform corrective action to reduce weekly average turbidity below the standard 50 NTU benchmark or the EPA-approved alternate benchmark for your dewatering discharges. The turbidity benchmark is not an effluent limit; rather it provides an action level that if exceeded indicates that the dewatering controls may not be working to protect water quality, in which case you must investigate and take appropriate corrective actions.

For each week that dewatering water is being discharged, you must compare the weekly average of turbidity monitoring results to the standard 50 NTU benchmark, or alternate benchmark if approved by EPA. The weekly average is calculated as the sum of the turbidity results divided by the number of samples. If you analyze more than one turbidity sample in a day, each result must be included in the weekly average calculation (Table 1). See CGP Part 3.3.3.c. For averaging purposes, a "monitoring week" starts with a Monday

Alternate benchmark thresholds

CGP Part 3.3.2.b allows you to request a turbidity benchmark that is higher than 50 NTUs if you have information showing the higher number is the same as your receiving water's water quality standard for turbidity. You must, however, use the standard 50 NTU benchmark until EPA approves an alternate benchmark.

and ends on the Sunday. Once a new monitoring week starts, you will need to calculate a new average for that week of turbidity monitoring results.

In the example shown in Table 1, the operator collected six samples within a monitoring week, with two samples taken on Friday and none taken on days when dewatering discharges did not occur. The resulting weekly average is 53 NTUs (rounded to the nearest whole number). In this case, the operator must take corrective action to reduce turbidity in their dewatering discharges because the weekly average exceeds the standard 50 NTU benchmark. See Section 4 for information on potential corrective actions.

Table 1. Example Weekly Average Turbidity Calculation, Intermittent Discharge

Day of the Week	Number of Turbidity Samples	Result (NTUs)
Monday	1	43
Tuesday	1	68
Wednesday	0	No discharge
Thursday	1	41
Friday	2	72
		48
Saturday	1	45
Sunday	0	No discharge
Weekly total	*6*	*317*
Weekly average	**—**	**53**

Similarly, if the operator only discharges dewatering water on one day during a monitoring week the turbidity result(s) from that day is the weekly average for that monitoring week, as shown in Table 2.

Table 2. Example Weekly Average Turbidity Calculation, One Sampling Event

Day of the Week	Number of Turbidity Samples	Result (NTUs)
Monday	0	No discharge
Tuesday	0	No discharge
Wednesday	0	No discharge
Thursday	1	28
Friday	0	No discharge
Saturday	0	No discharge
Sunday	0	No discharge
Weekly total	*1*	*28*
Weekly average	**—**	**28**

Section 4: Take Corrective Action

You must take corrective action if any of the following triggering conditions occurs:

- The weekly average of your turbidity monitoring results exceeds the standard 50 NTU benchmark or an alternate EPA-approved benchmark (CGP, Part 5.1.5.a).
- During dewatering discharge, you observe a sediment plume, suspended solids, unusual color, presence of odor, decreased clarity, or foam (CGP, Parts 4.6.3.e and 5.1.5.b) at the point of discharge to receiving waters or to constructed or natural site drainage features or storm drain inlets.
- During dewatering discharge, you observe a visible sheen on the water surface or visible oily deposits on the receiving water's bottom or shoreline (CGP, Parts 4.6.3.e and 5.1.5.b).
- EPA, State, or local authorities inform you that your dewatering discharge or the receiving water for the discharge has visual pollution indicators described above (CGP, Part 5.1.5.b).

4.A Corrective Action Deadlines

If your inspection observations or turbidity benchmark monitoring results trigger a corrective action, you must document the triggering condition in your corrective action log within 24 hours of identifying it, as well as the date and time it was identified. (See CGP Part 5.4 and Section 5.C of this guide.) You must also do all of the following:

- Immediately take all reasonable steps to minimize or prevent the discharge of pollutants until you can implement a solution, including shutting off the dewatering discharge as soon as possible (depending on the severity of the condition and taking safety considerations into account).
- Determine whether the dewatering controls are operating effectively and whether they are causing the conditions.
- Make any necessary adjustments, repairs, or replacements to the dewatering controls to lower the turbidity levels below the benchmark or remove the visible plume or sheen.

4.B Corrective Action Options

A successful corrective action will minimize or eliminate indicators of pollutants (e.g., sediment plume or sheen) observed in dewatering discharge or, if you are required to conduct turbidity benchmark monitoring, reduce turbidity such that the weekly average is below the benchmark threshold.

Pollutant Indicators Observed During a Dewatering Inspection

Table 3 presents possible corrective actions to address inspection observations of pollutant indicators. Some of them—such as evaluating the effectiveness of the dewatering treatment control—may require the assistance of an engineer, the vendor who provided the control, or another subject matter expert.

Table 3. Corrective Actions to Consider When Pollutant Indicators Are Observed in Dewatering Discharge

Observed Pollutant Indicator	Potential Corrective Actions
Dewatering water is causing erosion between the treatment control and the receiving water.	• Stop dewatering if the downgradient area shows signs of instability or erosion. • Investigate whether channels used to convey dewatering discharges are stabilized and protected with vegetation, riprap, erosion control blankets, or a similar erosion control measure. If not, implement appropriate erosion control measures. • Move dewatering controls installed on steep slopes to a flatter area. • Install outlet protection or a velocity dissipation device. • Move the discharge location, if possible, to a stable, erosion-resistant surface (e.g., well-vegetated grassy areas, clean filter stone, geotextile underlayment). • Check for leaking pumps, hoses, and pipe connections and fix if identified. Leaks under pressure can be significant causes of erosion.
Pollutant indicators such as a sediment plume, suspended solids, unusual color, odor, decreased clarity, or foam are observed in or on the dewatering water discharge.	• If ongoing construction activity is identified as the pollutant source, install or maintain stormwater control measures between active construction areas and the dewatering operation to minimize the transport of sediment and other pollutants into the dewatering operation. • If the dewatering control is not operating properly, maintain the dewatering treatment control to remove accumulated sediment and other pollutants. Sediment is typically removed before storage volume is reduced by one-third. • If you observe a distinct color or odor, look for raw materials, chemicals, or other materials used or stored near the area being dewatered. Move these materials away from the dewatering operation if you determine them to be the source of color, odor, foam, or sheen. • If you observe foam, check for and clean up any leaks or spills near the dewatering operation. • Stop dewatering and evaluate whether the installed dewatering treatment control is the correct treatment control for the site. Visual turbidity may indicate that installed dewatering controls are ineffective for the soil composition or site conditions, are undersized, or were incorrectly installed. For example, sediment filtration practices

Observed Pollutant Indicator	Potential Corrective Actions
	(e.g., dewatering bag filters, silt fence enclosures, sediment traps, basins) are effective at removing larger sediment particles, but fine particles need advanced treatment technology. An undersized or incorrectly installed treatment control may result in the discharge of untreated or partially treated dewatering water. An undersized treatment control will also need more frequent maintenance than a correctly sized one.
The water surface has a visible sheen or the receiving water's bottom or shoreline has visible oily deposits.	• Check upstream and downstream of the dewatering discharge location to see if a sheen or oily deposits may be coming from a different source such as a spill or other discharge from your site or a neighboring property. • Verify that your dewatering treatment control is equipped with an oil-water separator to remove oil, grease, and other hydrocarbons. If not, add an oil-water separator to the dewatering treatment control. • If an oil-water separator is already in place, perform any necessary maintenance to ensure that it is operating properly.

Exceedances of the Turbidity Benchmark Threshold

If the weekly average turbidity result exceeds the standard 50 NTU benchmark or an EPA-approved alternate benchmark, the magnitude of the exceedance may drive your corrective action response.

For example, if the weekly average of your turbidity monitoring results is slightly above the benchmark threshold, then maintenance of treatment controls and retraining sampling and analysis personnel (to ensure that related errors are not compromising the accuracy of the results) may be enough to reduce the site's weekly average turbidity result below the threshold.

You should safely shut off the discharge if the weekly average of your turbidity monitoring results significantly exceeds 50 NTUs or a single sample is extremely high (e.g., 355 NTUs or greater). In the latter case, the weekly average turbidity value will exceed 50 NTUs regardless of the turbidity values the other days during the week. See CGP Part 5.2.2.a. Evaluate the cause of the high turbidity; you may need to install a different treatment control or additional treatment controls to reduce turbidity levels below the benchmark threshold in highly turbid dewatering water.

You should also look at the individual turbidity results. Are they similar or was the weekly average influenced by an outlier that is significantly higher or lower than the other results for the week? For example, if most of the turbidity results are around 70 NTUs, one would expect the weekly average to be around 70 NTUs—but an outlier may be influencing that average. In the Table 1 example in Section 3.D, four of the six samples were between 40 and 50 NTUs, while the other two were 68 and 72 NTUs.

You should consider the possibility of unusual events or sampling conditions. (For example, were the two high-turbidity samples shown in Table 1 taken during unusual conditions?) You should evaluate outliers across weeks to see if a pattern emerges. Note that if you try to reduce the influence of outliers on the weekly average by performing more turbidity tests, each test result must be included in the weekly average calculation (CGP, Part 3.3.3.c).

Table 4 presents possible corrective actions to consider when the weekly average of your turbidity monitoring results exceeds 50 NTUs or an EPA-approved alternate benchmark threshold. If you consistently exceed the turbidity benchmark, consider whether you can avoid discharging to a sensitive water. Depending on dewatering flow rate, climate, and regulatory requirements, you may be able to land-apply and infiltrate (unless ground water contamination could result) dewatering water on-site.

Table 4. Corrective Actions to Consider for Weekly Turbidity Benchmark Monitoring Result Exceedances

Possible Cause of Turbidity Benchmark Monitoring Exceedance	Potential Corrective Actions
Sampling and analysis errors	• Reevaluate sampling locations to ensure the samples are representative of treated dewatering water. (For example, the designated sampling location may have been inaccessible; a dewatering sample may have been taken from a different location and therefore returned an unexpected turbidity result.) • Verify that the meter was calibrated before the analysis. • Make sure the cuvette, or other sampling container, is cleaned before the sample is collected. Solids or other residual pollutants from a previous sampling event may contaminate the sample. • Clean the outside of the cuvette prior to analysis. Dirt, smears, and ink can interfere with the meter's analysis, potentially resulting in an incorrect, elevated result. Refer to the meter's manual for directions on preparing cuvettes. • Check the cuvette for bubbles in the sample. Bubbles can cause an artificially high turbidity result.
Inadequate operation or maintenance of the dewatering treatment control	• Maintain the dewatering treatment control to remove accumulated sediment and other pollutants. Sediment is typically removed before storage volume is reduced by one-third. • Replace and clean filter media used in dewatering controls when the pressure differential equals or exceeds the manufacturer's specifications (CGP, Part 2.4.7). • Evaluate whether the installed dewatering treatment control is the correct treatment control for the site. Elevated turbidity may indicate that installed dewatering controls are ineffective for the soil composition or site conditions, are undersized, or were incorrectly installed. For example, sediment filtration practices (e.g., dewatering bag filters, silt

Possible Cause of Turbidity Benchmark Monitoring Exceedance	Potential Corrective Actions
	fence enclosures, sediment traps, basins) are effective at removing larger sediment particles, but fine particles need advanced treatment technology. An undersized or incorrectly installed treatment control may result in the discharge of untreated or partially treated dewatering water. An undersized treatment control will also need more frequent maintenance than a correctly sized one.
Erosion between the dewatering treatment control and the sampling location	• Stop dewatering if the downgradient area shows signs of instability or erosion. • Investigate whether channels used to convey dewatering discharges are stabilized and protected with vegetation, riprap, erosion control blankets, or a similar erosion control measure. If not, implement appropriate erosion control measures. • Move dewatering controls installed on steep slopes to a flatter area. • Install outlet protection or a velocity dissipation device. • Relocate discharge location, if possible, to a stable, erosion-resistant surface (e.g., well-vegetated grassy areas, clean filter stone, geotextile underlayment). • Check for leaking pumps, hoses, and pipe connections and fix if identified. Leaks under pressure can be significant causes of erosion.

You may resume discharging from your dewatering activities after completing the relevant corrective actions, including making any adjustments, repairs, or replacements to the dewatering controls. You should consider taking photographs of corrective actions, when possible, to supplement the descriptions in your corrective action log.

Section 5: Reporting and Recordkeeping

It is important that accurate recordkeeping of dewatering inspections and turbidity benchmark monitoring become a standard operating procedure at your construction site. You need to be able to show that records of dewatering inspections and turbidity benchmark monitoring, if required, meet all permit requirements. It is always preferable to document more than less when dealing with permit compliance. Create easy-to-use logbooks for keeping track of dewatering events. Ensure that your site map is current and easy to understand. Develop simple instruction sheets for recording inspection information and turbidity benchmark monitoring activities. Your SWPPP must include these instruction sheets (CGP, Part 7.2.7.e), and you should keep copies of the sheets with the sampling equipment.

When possible, record information on standardized forms such as EPA's dewatering inspection report template and corrective action log template (both available at EPA's CGP resources, tools, and templates webpage), as well as the sample Turbidity Benchmark Monitoring Data Table in Appendix A of this guide. This will provide consistency in information reported.

If possible, regularly transfer inspection and turbidity benchmark monitoring information into databases or spreadsheets. This will provide back-up records for hard-copy logs or forms as well as provide an easy way to analyze your sampling data.

5.A Recordkeeping for Dewatering Inspections

The following information must be recorded for each dewatering inspection (CGP, Part 4.6.3):

- The inspection date.
- Names and titles of personnel conducting the inspection.
- The approximate time that the dewatering discharge began and ended on the day of inspection. If dewatering is continuous, include this information in the record.
- Estimates of the rate (in gpd) of discharge on the day of inspection. You will need to read the flow meter, or estimate flow rate, and convert gpm into gpd using the number of minutes the site was discharging dewatering water. A continuous discharge, for example, would multiply gpm by 1,440 minutes to obtain gpd. See also Section 3.A.
- Evidence of pollutants at the point of discharge, including:
    - a sediment plume, suspended solids, unusual color, presence of odor, decreased clarity, or presence of foam and/or
    - a visible sheen on the water surface or visible oily deposits on the bottom or shoreline of the receiving water.
- Photographs of:
    - the dewatering water before treatment by a dewatering control(s) and the final discharge after treatment;
    - the dewatering treatment control(s); and

- the point of discharge to any receiving waters flowing through or immediately adjacent to the site and/or to constructed or natural site drainage features, storm drain inlets, and other conveyances to receiving waters.

You do not need to submit your inspection records to EPA, but you must maintain them at the permitted site, or at an easily accessible location, so that they are immediately available at the time of an on-site inspection or upon request by EPA. You must keep these records for at least three years after permit coverage is terminated or expires.

5.B Reporting Turbidity Monitoring Results

You must submit reports of your weekly average turbidity results to EPA no later than 30 days following the end of each monitoring quarter, shown in Table 5. If there are monitoring weeks in which there was no dewatering discharge, or if there is a monitoring quarter with no dewatering discharge, you must indicate this in the quarterly turbidity monitoring report.

Table 5. Monitoring Quarters and Deadlines for Reporting Monitoring Data

Monitoring Quarter	Months	Reporting Deadline
1	January 1–March 31	April 30
2	April 1–June 30	July 30
3	July 1–September 30	October 30
4	October 1–December 31	January 30

When you report your turbidity monitoring results for the quarter, you will be entering data for each monitoring week that have been given pre-assigned dates to ensure accuracy. Refer to Table K-1 in CGP Appendix K for a table of these dates.

Operators covered under the CGP submit all records and forms through the National Pollutant Discharge Elimination System Electronic Reporting Tool (NeT-CGP), including the quarterly turbidity monitoring reports, unless the applicable EPA Regional Office grants a waiver from electronic reporting. If you are granted such a waiver, you will use the Turbidity Monitoring Report Form in CGP Appendix K. Your NeT-CGP account will include the alternate turbidity benchmark if approved by EPA. You can find more information on electronic reporting at https://www.epa.gov/compliance/npdes-ereporting.

Reporting requirements for sites with multiple operators

Where multiple operators are subject to the turbidity monitoring requirements associated with the same site, and one operator has agreed to be responsible for the monitoring activities, only that operator is required to report the site's weekly average turbidity results. The operator submitting the turbidity monitoring reports must indicate that it is fulfilling the obligations of other operators covered under the permit for the same project site, and must identify the NPDES ID number(s) for all other such operators (Turbidity Monitoring Report Form, CGP, Appendix K).

5.C Corrective Action Log

You must record each corrective action related to your dewatering operations in the site's corrective action log. This log is a CGP-required record of the operator's responses to observed indicators of pollutants or turbidity benchmark exceedances (CGP, Part 5.4). Record corrective actions as follows:

- Within 24 hours of identifying the corrective action trigger, document the specific trigger and the date and time it was identified.
- Within 24 hours of completing the corrective action (in accordance with the deadlines in CGP Part 5.2), document the actions taken to address the condition, including whether any SWPPP modifications are required.
- Each entry to the corrective action log must be signed by the operator's signatory in accordance with the CGP's Standard Permit Conditions (CGP, Appendix G). The signatory may be either the person holding the position that signed the NOI for coverage under the CGP or a duly authorized representative of that person. See CGP Appendix G, Section G.11.2.

You may prepare, sign, and maintain an electronic corrective action log, instead of a paper log, if the records are:

- in a format that can be read in a similar manner as a paper record;
- legally dependable with no less evidentiary value than their paper equivalent; and
- immediately accessible to the inspector during an inspection to the same extent as a paper copy stored at the site would be, if the records were stored in paper form. See footnote to CGP Part 5.4.3.

As mentioned previously, you may use EPA's Corrective Action Log Template, available at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates, to document your corrective actions as required under CGP Part 5.4.

The corrective action log, or an up-to-date copy, must be kept at the site or at an easily accessible location, so that it is immediately available at the time of an on-site inspection or upon request by EPA (CGP, Part 5.4.3). Additionally, the operator must keep the complete corrective action log for at least three years from the date CGP coverage expires or is terminated.

Section 6: Train Personnel

Each operator, or group of multiple operators on a single site, must assemble a "stormwater team" that will carry out activities, including those related to dewatering discharges, necessary to comply with the CGP. Each stormwater team member must understand the CGP requirements (CGP, Part 6.2), including:

- The permit requirements and deadlines associated with installation, maintenance, and removal of stormwater controls and stabilization.
- The locations of all stormwater and dewatering controls on the site required by this permit and how they are to be maintained.
- The proper procedures to follow with respect to the permit's pollution prevention requirements.
- When and how to conduct stormwater and dewatering inspections, record applicable findings, and take corrective action.

Any stormwater team member who performs dewatering inspections must be a "qualified person."

Before February 17, 2023, the qualified person, or persons, must be "knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention, who possesses the appropriate skills and training to assess conditions at the construction site that could impact stormwater quality, and the appropriate skills and training to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of this permit" (CGP, Part 6.3).

Beginning February 17, 2023, all qualified persons conducting site inspections, including dewatering inspections, must:

- have completed the EPA construction inspection course developed for this permit and have passed the exam or
- hold a current valid construction inspection certification or license from a program that, at a minimum, covers the following:
    - principles and practices of erosion and sediment control and pollution prevention practices at construction sites;
    - proper installation and maintenance of erosion and sediment controls and pollution prevention practices used at construction sites; and
    - performance of inspections, including the proper completion of required reports and documentation, consistent with the CGP's site inspection requirements (CGP, Part 6.3).

The EPA CGP construction inspection course is offered free of charge. Several private companies and some State governments and municipalities offer construction stormwater inspection training and certification, usually for a fee.

In addition to these training requirements, you should train staff responsible for turbidity benchmark monitoring in the procedures for sample collection, reporting, and recordkeeping. Trainings should be held regularly to update staff on any changes to the permit or SWPPP related to procedures for turbidity benchmark monitoring from dewatering discharges. Employees who will be responsible for turbidity benchmark monitoring should be trained on the following:

- Where to monitor.
- How to collect and analyze samples for turbidity.
- How to interpret turbidity results.
- How to keep accurate and complete records.
- How to report turbidity benchmark monitoring results to EPA.

Section 7: References

U.S. Environmental Protection Agency. (1992). *NPDES storm water sampling guidance document*. EPA 833-8-92-001.

U.S. Environmental Protection Agency. (2015). *Getting up to speed: Groundwater contamination*. EPA 625-R-93-002.

U.S. Environmental Protection Agency. (2021). *Overview of listing impaired waters under CWA Section 303(d)*.

U.S. Environmental Protection Agency. (2022). *NPDES general permit for discharges from construction activities (CGP).*

U.S. Geological Survey. 2019. *Water-quality benchmarks for contaminants*.

Appendix A: Sample Turbidity Benchmark Monitoring Data Table

Turbidity Benchmark Monitoring Data Table

Operator:	**Project Name:**
Dewatering Discharge Point ID (if multiple discharge points)**:**	**Sample Location:**
Turbidity Meter (make and model)**:**	**Test Method** (e.g., EPA 180.1)**:**

Sample Collection			Turbidity Analysis					
Name of Individual Collecting Sample	**Date**	**Time**	**Name of Individual Analyzing Sample**	**Date**	**Time**	**Meter Calibrated?**	**Turbidity Result (NTUs)**	**Notes**
						☐ Yes		
						☐ Yes		
						☐ Yes		
						☐ Yes		
						☐ Yes		
						☐ Yes		
						☐ Yes		
						☐ Yes		
						☐ Yes		
						☐ Yes		
						☐ Yes		
						☐ Yes		

APPENDIX F

ENDANGERED SPECIES RESEARCH DOCUMENTATION

Ledge Road Landfill Closure NOI - ACEC & NHESP Priority Habitats

APPENDIX G

DOCUMENTATION OF QUERIES OF MACRIS

MACRIS Maps | Enter search ID | Search | Zoom to a town | More | Login

Address Search | Tools | Layers

Enter a street address, intersection, or place of interest and a Massachusetts town.

10 ledge road

Andover MA

Search | Clear

Address/Place Matches (1)

Street View

10 Ledge Road, Andover, Massachusetts, 01810

APPENDIX H

SUBCONTRACTOR CERTIFICATIONS/AGREEMENTS

Subcontractor Certifications/Agreements

Subcontractor Certification
Stormwater Pollution Prevention Plan

Project Number: _____

Project Title: _____

Operator(s): _____

As a subcontractor, you are required to comply with the Stormwater Pollution Prevention Plan (SWPPP) for any work that you perform on-site. Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract. You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is available for your review at the office trailer.

Each subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement:

I certify under the penalty of law that I have read and understand the terms and conditions of the SWPPP for the above designated project and agree to follow the practices described in the SWPPP.

This certification is hereby signed in reference to the above named project:

Company: _____

Address: _____

Telephone Number: _____

Type of construction service to be provided: _____

_____

_____

Signature: _____

Title: _____

Date: _____

APPENDIX I

GRADING AND STABILIZATION ACTIVITIES LOG

Grading and Stabilization Activities Log

Date Grading Activity Initiated	**Description of Grading Activity**	**Description of Stabilization Measure and Location**	**Date Grading Activity Ceased** (Indicate Temporary or Permanent)	**Date When Stabilization Measures Initiated**
			☐ Temporary ☐ Permanent	
			☐ Temporary ☐ Permanent	
			☐ Temporary ☐ Permanent	
			☐ Temporary ☐ Permanent	
			☐ Temporary ☐ Permanent	
			☐ Temporary ☐ Permanent	
			☐ Temporary ☐ Permanent	
			☐ Temporary ☐ Permanent	

APPENDIX J

TRAINING RECORDS

Construction SWPPP Training Record

The following individuals have received Construction Stormwater Pollution Prevention Plan (SWPPP) training as described below:

Training Topic: _____

Description of Training or Plan Review: _____

_____

_____

Date of Training: _____

Personnel Conducting Training: _____

List of Attendees:

Name	Signature	Date

APPENDIX K

RAINFALL GAUGE RECORDING

Rainfall Gauge Recording

Use the table below to record the rainfall gauge readings at the beginning and end of each work day. An example table follows.

Month/Year			Month/Year			Month/Year		
Day	Start time	End time	Day	Start time	End time	Day	Start time	End time
1			1			1		
2			2			2		
3			3			3		
4			4			4		
5			5			5		
6			6			6		
7			7			7		
8			8			8		
9			9			9		
10			10			10		
11			11			11		
12			12			12		
13			13			13		
14			14			14		
15			15			15		
16			16			16		
17			17			17		
18			18			18		
19			19			19		
20			20			20		
21			21			21		
22			22			22		
23			23			23		
24			24			24		
25			25			25		
26			26			26		
27			27			27		
28			28			28		
29			29			29		
30			30			30		
31			31			31		

APPENDIX L

2022 NPDES CONSTRUCTION GENERAL PERMIT

National Pollutant Discharge Elimination System (NPDES)
Construction General Permit (CGP) for Stormwater Discharges from Construction Activities

In compliance with the provisions of the Clean Water Act, 33 U.S.C. §1251 et. seq., (hereafter CWA), as amended by the Water Quality Act of 1987, P.L. 100-4, "operators" of construction activities (defined in Appendix A) that meet the requirements of Part 1.1 of this National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP), are authorized to discharge pollutants in accordance with the effluent limitations and conditions set forth herein. Permit coverage is required from the "commencement of construction activities" (see Appendix A) until one of the conditions for terminating CGP coverage has been met (see Part 8.2).

This permit becomes effective on 12:00 am, April 8, 2025.

This permit and the authorization to discharge expire at 11:59pm, February 16, 2027.

The 2022 CGP was modified to expand the list of areas eligible for coverage to include Lands of Exclusive Federal Jurisdiction in the U.S., to clarify the requirements that apply to projects that discharge to receiving waters within these areas, and to make corresponding changes in Appendices A, B, and D. See *2022 CGP Modification - Fact Sheet* for additional information.

Signed and issued this 8th day of April 2025

JAVIER LAUREANO PEREZ
Digitally signed by JAVIER LAUREANO PEREZ
Date: 2025.04.08 09:24:10 -04'00'

Javier Laureano Perez,
Director, Water Division, EPA Region 2.

Signed and issued this 8th day of April 2025

CARMEN GUERRERO PEREZ
Digitally signed by CARMEN GUERRERO PEREZ
Date: 2025.04.08 12:41:41 -04'00'

Carmen Guerrero Perez,
Director, Caribbean Environmental Protection Division,
EPA Region 2.

Signed and issued this 8th day of April 2025

KATHLENE BUTLER
Digitally signed by KATHLENE BUTLER
Date: 2025.04.08 14:05:04 -04'00'

Kathlene Butler,
Director, Water Division, EPA Region 4.

Signed and issued this 8th day of April 2025

TERA FONG
Digitally signed by TERA FONG
Date: 2025.04.08 15:01:22 -05'00'

Tera Fong,
Director, Water Division, EPA Region 5.

Signed and issued this 8th day of April 2025

TROY HILL
Digitally signed by TROY HILL
Date: 2025.04.08 14:04:26 -05'00'

Troy Hill,
Director, Water Division, EPA Region 6.

Signed and issued this 8th day of April 2025

JEFFERY ROBICHAUD
Digitally signed by JEFFERY ROBICHAUD
Date: 2025.04.08 14:31:40 -05'00'

Jeffery Robichaud,
Director, Water Division, EPA Region 7.

Signed and issued this 8th day of April 2025

STEPHANIE DEJONG
Digitally signed by STEPHANIE DEJONG
Date: 2025.04.08 09:32:38 -06'00'

Stephanie DeJong,
Manager, Clean Water Branch, EPA Region 8.

Signed and issued this 8th day of April 2025

Digitally signed by TOMAS TORRES
Date: 2025.04.08 09:19:32 -07'00'

Tomas Torres,
Director, Water Division, EPA Region 9.

Signed and issued this 8th day of April 2025

MATHEW MARTINSON
MATHEW MARTINSON
2025.04.08 14:41:11 -07'00'

Mathew Martinson,
Director, Water Division, EPA Region 10.

For EPA Regions 1 and 3, this modified permit becomes effective at 2:00 pm, June 10, 2025. This permit and the authorization to discharge expire at 11:59pm, February 16, 2027.

The 2022 CGP was modified to expand the list of areas eligible for coverage to include Lands of Exclusive Federal Jurisdiction in the U.S., to clarify the requirements that apply to projects that discharge to receiving waters within these areas, and to make corresponding changes in Appendices A, B, and D. See *2022 CGP Modification - Fact Sheet* for additional information.

Signed and issued this 10th day of June 10, 2025

MARK SANBORN

Digitally signed by MARK SANBORN
Date: 2025.06.10 11:00:04 -04'00'

Mark Sanborn
Regional Administrator, EPA Region 1

Signed and issued this 10th day of June 10, 2025

MICHELLE PRICE-FAY

Digitally signed by MICHELLE PRICE-FAY
Date: 2025.06.10 09:35:25 -04'00'

Michelle Price-Fay
Director, Water Division, EPA Region 3

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1 HOW TO OBTAIN COVERAGE UNDER THE CONSTRUCTION GENERAL PERMIT (CGP)

To be covered under this permit, you must meet the eligibility conditions and follow the requirements for obtaining permit coverage in this Part.

1.1 ELIGIBILITY CONDITIONS

1.1.1 You are an "operator" of a construction site for which discharges will be covered under this permit. For the purposes of this permit and in the context of stormwater discharges associated with construction activity, an "operator" is any party associated with a construction project that meets either of the following two criteria:

- **a.** The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or
- **b.** The party has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions.

Where there are multiple operators associated with the same project, all operators must obtain permit coverage.[1] Subcontractors generally are not considered operators for the purposes of this permit.

1.1.2 Your site's construction activities:

- **a.** Will disturb one or more acres of land, or will disturb less than one acre of land but are part of a common plan of development or sale (as defined in Appendix A) that will ultimately disturb one or more acres of land; or
- **b.** Have been designated by EPA as needing permit coverage under 40 CFR § 122.26(a)(1)(v) or 40 CFR § 122.26(b)(15)(ii);

1.1.3 Your site is located in an area where EPA is the permitting authority and where coverage under this permit is available (see Appendix B).

1.1.4 Discharges from your site are not:

- **a.** Already covered by a different NPDES permit for the same discharge; or
- **b.** In the process of having coverage under a different NPDES permit for the same discharge denied, terminated, or revoked.[2, 3]

1.1.5 You can demonstrate you meet one of the criteria in the Endangered Species Protection section of the Notice of Intent (NOI) that you submit for coverage under this permit, per Part 1.4, with respect to the protection of Federally listed endangered or threatened species and Federally designated critical habitat under the Endangered Species Act (ESA). If the EPA Regional Office grants you a waiver from electronic reporting per Part

[1] If the operator of a "construction support activity" (see Part 1.2.1c) is different than the operator of the main site, that operator must also obtain permit coverage. See Part 7.1 for clarification on the sharing of permit-related functions between and among operators on the same site and for conditions that apply to developing a SWPPP for multiple operators associated with the same site.

[2] Parts 1.1.4a and 1.1.4b do not include sites currently covered under the 2017 CGP that are in the process of obtaining coverage under this permit, nor sites covered under this permit that are transferring coverage to a different operator.

[3] Notwithstanding a site being made ineligible for coverage under this permit because it falls under the description of Parts 1.1.4a or 1.1.4b, above, EPA may waive the applicable eligibility requirement after specific review if it determines that coverage under this permit is appropriate.

1.4.2, you must complete the ESA worksheet in Appendix D to demonstrate you meet one of the criteria and submit it with your paper NOI (Appendix I).

1.1.6 You have completed the screening process in Appendix E relating to the protection of historic properties; and

1.1.7 You have complied with all requirements in Part 9 imposed by the applicable State, Indian Tribe, or Territory in which your construction activities and/or discharge will occur.[4]

1.1.8 For "new sources" (as defined in Appendix A) only:

a. EPA has not, prior to authorization under this permit, determined that discharges from your site will not meet applicable water quality standards. Where such a determination is made prior to authorization, EPA may notify you that an individual permit application is necessary. However, EPA may authorize your coverage under this permit after you have included appropriate controls and implementation procedures designed to bring your discharge into compliance with this permit, specifically the requirement to meet water quality standards. In the absence of information demonstrating otherwise, EPA expects that compliance with the requirements of this permit, including the requirements applicable to such discharges in Part 3, will result in discharges that meet applicable water quality standards.

b. Discharges from your site to a Tier 2, Tier 2.5, or Tier 3 water[5] will not lower the water quality of the applicable water. In the absence of information demonstrating otherwise, EPA expects that compliance with the requirements of this permit, including the requirements applicable to such discharges in Part 3.2, will result in discharges that will not lower the water quality of such waters.

1.1.9 If you plan to add "cationic treatment chemicals" (as defined in Appendix A) to stormwater and/or authorized non-stormwater prior to discharge, you may not submit your NOI until you notify your applicable EPA Regional Office (see Appendix J) in advance and the EPA Regional Office authorizes coverage under this permit after you have included appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will result in discharges that meet applicable water quality standards.

[4] EPA notes that the requirements of Part 9 do not apply to projects within Lands of Exclusive Federal Jurisdiction.

[5] Note: Your site will be considered to discharge to a Tier 2, Tier 2.5, or Tier 3 water if the first receiving water to which you discharge is identified by a State, Tribe, or EPA as a Tier 2, Tier 2.5, or Tier 3 water. For discharges that enter a storm sewer system prior to discharge, the first receiving water to which you discharge is the waterbody that receives the stormwater discharge from the storm sewer system. The current list of Tier 2, Tier 2.5, and Tier 3 waters located in the areas eligible for coverage under this permit can be found at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates. You can also use EPA's Discharge Mapping Tool (https://www.epa.gov/npdes/epas-stormwater-discharge-mapping-tools) to assist you in identifying whether any receiving waters to which you discharge are listed as impaired (and the pollutant for which it is impaired) and whether an approved total maximum daily load (TMDL) exists for that waterbody.

1.2 TYPES OF DISCHARGES AUTHORIZED[6]

1.2.1 The following stormwater discharges are authorized under this permit provided that appropriate stormwater controls are designed, installed, and maintained (see Parts 2 and 3):

- **a.** Stormwater discharges, including stormwater runoff, snowmelt runoff, and surface runoff and drainage, associated with construction activity under 40 CFR § 122.26(b)(14) or § 122.26(b)(15)(i);
- **b.** Stormwater discharges designated by EPA as needing a permit under 40 CFR §122.26(a)(1)(v) or § 122.26(b)(15)(ii);
- **c.** Stormwater discharges from on or off-site construction support activities (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas) provided that:
  - **i.** The support activity is directly related to the construction site required to have permit coverage for stormwater discharges;
  - **ii.** The support activity is not a commercial operation, nor does it serve multiple unrelated construction sites;
  - **iii.** The support activity does not continue to operate beyond the completion of the construction activity at the site it supports; and
  - **iv.** Stormwater controls are implemented in accordance with Part 2 and Part 3 for discharges from the support activity areas; and
- **d.** Stormwater discharges from earth-disturbing activities associated with the construction of staging areas and the construction of access roads conducted prior to active mining.

1.2.2 The following non-stormwater discharges associated with your construction activity are authorized under this permit provided that, with the exception of water used to control dust and to irrigate vegetation in stabilized areas, these discharges are not routed to areas of exposed soil on your site and you comply with any applicable requirements for these discharges in Parts 2 and 3:

- **a.** Discharges from emergency fire-fighting activities;
- **b.** Fire hydrant flushings;
- **c.** Landscape irrigation;
- **d.** Water used to wash vehicles and equipment, provided that there is no discharge of soaps, solvents, or detergents used for such purposes;
- **e.** Water used to control dust;
- **f.** Potable water including uncontaminated water line flushings;

[6] See "Discharge" as defined in Appendix A. Note: Any discharges not expressly authorized in this permit cannot become authorized or shielded from liability under CWA Section 402(k) by disclosure to EPA, State, or local authorities after issuance of this permit via any means, including the Notice of Intent (NOI) to be covered by the permit, the SWPPP, or during an inspection.

g. External building washdown, provided soaps, solvents, and detergents are not used, and external surfaces do not contain hazardous substances (as defined in Appendix A) (e.g., paint or caulk containing polychlorinated biphenyls (PCBs));

h. Pavement wash waters, provided spills or leaks of toxic or hazardous substances have not occurred (unless all spill material has been removed) and where soaps, solvents, and detergents are not used. You are prohibited from directing pavement wash waters directly into any receiving water, storm drain inlet, or constructed or natural site drainage features, unless the feature is connected to a sediment basin, sediment trap, or similarly effective control;

i. Uncontaminated air conditioning or compressor condensate;

j. Uncontaminated, non-turbid discharges of ground water or spring water;

k. Foundation or footing drains where flows are not contaminated with process materials such as solvents or contaminated ground water; and

l. Uncontaminated construction dewatering water[7] discharged in accordance with Part 2.4.

1.2.3 Also authorized under this permit are discharges of stormwater listed above in Part 1.2.1, or authorized non-stormwater discharges listed above in Part 1.2.2, commingled with a discharge authorized by a different NPDES permit and/or a discharge that does not require NPDES permit authorization.

1.3 PROHIBITED DISCHARGES[8]

The discharges listed in this Part are prohibited outright or authorized only under the identified conditions. To prevent the discharges in Parts 1.3.1 through 1.3.5, operators must comply with the applicable pollution prevention requirements in Part 2.3 or ensure the discharge is authorized by another NPDES permit consistent with Part 1.2.3 for commingled discharges.

1.3.1 Wastewater from washout of concrete, unless managed by an appropriate control as described in Part 2.3.4;

1.3.2 Wastewater from washout and/or cleanout of stucco, paint, form release oils, curing compounds, and other construction materials;

1.3.3 Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance;

1.3.4 Soaps, solvents, or detergents used in vehicle and equipment washing or external building washdown; and

1.3.5 Toxic or hazardous substances from a spill or other release.

[7] EPA notes that operators may need to comply with additional procedures to verify that the dewatering discharge is uncontaminated. Operators should review Part 9 to determine if any of these requirements apply to their discharge and should ensure that they have complied with any State, Tribal, or local dewatering requirements that apply.

[8] EPA includes these prohibited non-stormwater discharges here as a reminder to the operator that the only non-stormwater discharges authorized by this permit are at Part 1.2.2. Any unauthorized non-stormwater discharges must be covered under an individual permit or alternative general permit.

1.4 SUBMITTING YOUR NOTICE OF INTENT (NOI)

All "operators" (as defined in Appendix A) associated with your construction site who meet the Part 1.1 eligibility conditions, and who seek coverage under this permit, must submit to EPA a complete and accurate NOI in accordance with the deadlines in Table 1 prior to commencement of construction activities (as defined in Appendix A).

Exception: If you are conducting construction activities in response to a public emergency (e.g., mud slides, earthquake, extreme flooding conditions, widespread disruption in essential public services), and the related work requires immediate authorization to avoid imminent endangerment to human health, public safety, or the environment, or to reestablish essential public services, you may discharge on the condition that a complete and accurate NOI is submitted within 30 calendar days after commencing construction activities (see Table 1) establishing that you are eligible for coverage under this permit. You must also provide documentation in your Stormwater Pollution Prevention Plan (SWPPP) to substantiate the occurrence of the public emergency pursuant to Part 7.2.3i.

1.4.1 Prerequisite for Submitting Your NOI

You must develop a SWPPP consistent with Part 7 before submitting your NOI for coverage under this permit.

1.4.2 How to Submit Your NOI

You must use EPA's NPDES eReporting Tool (NeT) to electronically prepare and submit your NOI for coverage under the 2022 CGP unless you received a waiver from your applicable EPA Regional Office.

To access NeT, go to https://cdx.epa.gov/cdx.

Waivers from electronic reporting may be granted based on one of the following conditions:

a. If your operational headquarters is physically located in a geographic area (i.e., ZIP code or census tract) that is identified as under-served for broadband Internet access in the most recent report from the Federal Communications Commission; or

b. If you have limitations regarding available computer access or computer capability.

If the EPA Regional Office grants you approval to use a paper NOI, and you elect to use it, you must complete the form in Appendix H.

1.4.3 Deadlines for Submitting Your NOI and Your Official Date of Permit Coverage

Table 1 provides the deadlines for submitting your NOI and the official start date of your permit coverage, which differ depending on when you commence construction activities.

Table 1 NOI Submittal Deadlines and Official Start Date for Permit Coverage.

Type of Operator	NOI Submittal Deadline[9]	Permit Authorization Date[10]
Operator of a new site (i.e., a site where construction activities commence on or after February 17, 2022)	At least 14 calendar days before commencing construction activities.	14 calendar days after EPA notifies you that it has received a complete NOI, unless EPA notifies you that your authorization is delayed or denied.
Operator of an existing site (i.e., a site with 2017 CGP coverage where construction activities commenced prior to February 17, 2022)	No later than May 18, 2022.	14 calendar days after EPA notifies you that it has received a complete NOI, unless EPA notifies you that your authorization is delayed or denied. Provided you submit your NOI no later than May 18, 2022, your authorization under the 2017 CGP is automatically continued until you have been granted coverage under this permit or an alternative NPDES permit, or coverage is otherwise terminated.
New operator of a permitted site (i.e., an operator that through transfer of ownership and/or operation replaces the operator of an already permitted construction site that is either a "new site" or an "existing site")	At least 14 calendar days before the date the transfer to the new operator will take place.	14 calendar days after EPA notifies you that it has received a complete NOI, unless EPA notifies you that your authorization is delayed or denied.
Operator of an "emergency-related project" (i.e., a project initiated in response to a public emergency (e.g., mud slides, earthquake, extreme flooding conditions, disruption in essential public services), for which the related work requires immediate authorization to avoid imminent endangerment to human health or the environment, or to reestablish essential public services)	No later than 30 calendar days after commencing construction activities.	You are considered provisionally covered under the terms and conditions of this permit immediately, and fully covered 14 calendar days after EPA notifies you that it has received a complete NOI, unless EPA notifies you that your authorization is delayed or denied.

[9] If you miss the deadline to submit your NOI, any and all discharges from your construction activities will continue to be unauthorized under the CWA until they are covered by this or a different NPDES permit. EPA may take enforcement action for any unpermitted discharges that occur between the commencement of construction activities and discharge authorization.

[10] Discharges are not authorized if your NOI is incomplete or inaccurate or if you are not eligible for permit coverage.

1.4.4 Modifying your NOI

If after submitting your NOI you need to correct or update any fields, you may do so by submitting a "Change NOI" form using NeT. Waivers from electronic reporting may be granted as specified in Part 1.4.2. If the EPA Regional Office has granted you approval to submit a paper NOI modification, you may indicate any NOI changes on the same NOI form in Appendix H.

When there is a change to the site's operator, the new operator must submit a new NOI, and the previous operator must submit a Notice of Termination (NOT) form as specified in Part 8.3.

The following modifications to an NOI form will result in a 14-day review process:

- Changes to the name of the operator;
- Changes to the project or site name;
- Changes to the estimated area to be disturbed;
- Changes to the name of the receiving water[11], or additions to the applicable receiving waters;
- Changes to eligibility information related to endangered species protection or historic preservation;
- Changes to information provided related to the use of chemical treatment at your site; and
- Changes to answers provided regarding the demolition of structures over 10,000 square feet of floor space built or renovated before January 1, 1980.

During the 14-day review process, you may continue to operate based on the information provided in your original NOI, but you must wait until the review period has ended before you may commence or continue activities on any portion of your site that would be affected by any of the above modifications, unless EPA notifies you that the authorization is delayed or denied.

1.4.5 Your Official End Date of Permit Coverage

Once covered under this permit, your coverage will last until the date that:

a. You terminate permit coverage consistent with Part 8; or

b. You receive permit coverage under a different NPDES permit or a reissued or replacement version of this permit after expiring on February 16, 2027; or

c. You fail to submit an NOI for coverage under a reissued or replacement version of this permit before the deadline for existing construction sites where construction activities continue after this permit has expired.

1.5 REQUIREMENT TO POST A NOTICE OF YOUR PERMIT COVERAGE

You must post a sign or other notice of your permit coverage at a safe, publicly accessible location in close proximity to the construction site. The notice must be located so it is visible from the public road that is nearest to the active part of the construction

[11] As defined in Appendix A, a "receiving water" is "a "Water of the United States" as defined in 40 CFR §122.2 into which the regulated stormwater discharges.

site, and it must use a font large enough to be readily viewed from a public right-of-way.[12] At a minimum, the notice must include:

a. The NPDES ID (i.e., permit tracking number assigned to your NOI and the EPA webpage where a copy of the NOI can be found (https://permitsearch.epa.gov/epermit-search/ui/search));

b. A contact name and phone number for obtaining additional construction site information;

c. The Uniform Resource Locator (URL) for the SWPPP (if available), or the following statement: "If you would like to obtain a copy of the Stormwater Pollution Prevention Plan (SWPPP) for this site, contact the EPA Regional Office at [*include the appropriate CGP Regional Office contact information found at* https://www.epa.gov/npdes/contact-us-stormwater#regional];" and

d. The following statement "If you observe indicators of stormwater pollutants in the discharge or in the receiving water, contact the EPA through the following website: https://www.epa.gov/enforcement/report-environmental-violations."

2 TECHNOLOGY-BASED EFFLUENT LIMITATIONS

You must comply with the following technology-based effluent limitations in this Part for all authorized discharges.[13]

2.1 GENERAL STORMWATER CONTROL DESIGN, INSTALLATION, AND MAINTENANCE REQUIREMENTS

You must design, install, and maintain stormwater controls required in Parts 2.2, 2.3, and 2.4 to minimize the discharge of pollutants in stormwater from construction activities.[14] To meet this requirement, you must:

2.1.1 Account for the following factors in designing your stormwater controls:

a. The expected amount, frequency, intensity, and duration of precipitation;[15]

b. The nature of stormwater runoff (i.e., flow) and run-on at the site, including factors such as expected flow from impervious surfaces, slopes, and site drainage features. You must design stormwater controls to control stormwater volume, velocity, and peak flow rates to minimize discharges of pollutants in stormwater and to minimize channel and streambank erosion and scour in the immediate vicinity of discharge points; and

c. The soil type and range of soil particle sizes expected to be present on the site.

[12] If the active part of the construction site is not visible from a public road, then place the notice of permit coverage in a position that is visible from the nearest public road and as close as possible to the construction site.

[13] For each of the effluent limits in Part 2, as applicable to your site, you must include in your SWPPP (1) a description of the specific control(s) to be implemented to meet the effluent limit; (2) any applicable design specifications; (3) routine maintenance specifications; and (4) the projected schedule for installation/implementation. See Part 7.2.6.

[14] The permit does not recommend or endorse specific products or vendors.

[15] Stormwater controls must be designed using the most recent data available to account for recent precipitation patterns and trends.

If your site is exposed to or has previously experienced major storms, such as hurricanes, storm surge, extreme/heavy precipitation, and flood events, you should also include consideration of and contingencies for whether implementing structural improvements, enhanced/resilient stormwater controls, and other mitigation measures may help minimize impacts from stormwater discharges from such major storm events.

2.1.2 Design and install all stormwater controls in accordance with good engineering practices, including applicable design specifications.[16]

2.1.3 Complete installation of stormwater controls by the time each phase of construction activities has begun.

a. By the time construction activity in any given portion of the site begins, install and make operational any downgradient sediment controls (e.g., buffers, perimeter controls, exit point controls, storm drain inlet protection) that control discharges from the initial site clearing, grading, excavating, and other earth-disturbing activities.[17]

b. Following the installation of these initial controls, install and make operational all stormwater controls needed to control discharges prior to subsequent earth-disturbing activities.

2.1.4 Ensure all stormwater controls are maintained and remain in effective operating condition during permit coverage and are protected from activities that would reduce their effectiveness.

a. Comply with any specific maintenance requirements for the stormwater controls listed in this permit, as well as any recommended by the manufacturer.[18]

b. If at any time you find that a stormwater control needs routine maintenance (i.e., minor repairs or other upkeep performed to ensure the site's stormwater controls remain in effective operating condition, not including significant repairs or the need to install a new or replacement control), you must immediately initiate the needed work, and complete such work by the close of the next business day. If it is infeasible to complete the routine maintenance by the close of the next business day, you must document why this is the case and why the repair or other upkeep to be performed should still be considered routine maintenance in your inspection report under Part 4.7.1c and complete such work no later than seven (7) calendar days from the time of discovery of the condition requiring maintenance.

c. If you must repeatedly (i.e., three (3) or more times) make the same routine maintenance fixes to the same control at the same location, even if the fix can be completed by the close of the next business day, you must either:

i. Complete work to fix any subsequent repeat occurrences of this same problem under the corrective action procedures in Part 5, including keeping any records

[16] Design specifications may be found in manufacturer specifications and/or in applicable erosion and sediment control manuals or ordinances. Any departures from such specifications must reflect good engineering practices and must be explained in your SWPPP. You must also comply with any additional design and installation requirements specified for the effluent limits in Parts 2.2, 2.3, and 2.4.

[17] Note that the requirement to install stormwater controls prior to each phase of construction activities for the site does not apply to the earth disturbance associated with the actual installation of these controls. Operators should take all reasonable actions to minimize the discharges of pollutants during the installation of stormwater controls.

[18] Any departures from such maintenance recommendations made by the manufacturer must reflect good engineering practices and must be explained in your SWPPP.

of the condition and how it was corrected under Part 5.4; or

ii. Document in your inspection report under Part 4.7.1c why the specific reoccurrence of this same problem should still be addressed as a routine maintenance fix under this Part.[19]

d. If at any time you find that a stormwater control needs a significant repair or that a new or replacement control is needed, you must comply with the corrective action deadlines for completing such work in in Part 5.2.1c.

2.2 EROSION AND SEDIMENT CONTROL REQUIREMENTS

You must implement erosion and sediment controls in accordance with the following requirements to minimize the discharge of pollutants in stormwater from construction activities.

2.2.1 Provide and maintain natural buffers and/or equivalent erosion and sediment controls for discharges to any receiving waters that is located within 50 feet of the site's earth disturbances.

a. Compliance Alternatives. For any discharges to receiving waters located within 50 feet of your site's earth disturbances, you must comply with one of the following alternatives:

i. Provide and maintain a 50-foot undisturbed natural buffer; or

ii. Provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by erosion and sediment controls that achieve, in combination, the sediment load reduction equivalent to a 50-foot undisturbed natural buffer; or

iii. If infeasible to provide and maintain an undisturbed natural buffer of any size, implement erosion and sediment controls to achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.

See Appendix F, Part F.2 for additional conditions applicable to each compliance alternative.

b. Exceptions. See Appendix F, Part F.2 for exceptions to the compliance alternatives.

2.2.2 Direct stormwater to vegetated areas and maximize stormwater infiltration and filtering to reduce pollutant discharges, unless infiltration would be inadvisable due to the underlying geology (e.g., karst topography) and ground water contamination concerns, or infeasible due to site conditions.[20]

[19] Such documentation could include, for example, that minor repairs completed within the required timeframe are all that is necessary to ensure that the stormwater control continues to operate as designed and installed and that the stormwater control remains appropriate for the flow reaching it.

[20] Operators should consider whether factors such as specific contaminant concerns from the construction site, the underlying soils or geology, hydrology, depth to the ground water table, or proximity to source water or wellhead protection area(s) make the site unsuitable for infiltrating construction stormwater. Site conditions that may be of particular concern include proximity to: a current or future drinking water aquifer; a drinking water well or spring (including private/household wells); highly conductive geology such as karst; known pollutant hot spots, such as hazardous waste sites, landfills, gas stations, brownfields; an on-site sewage system or underground storage tank; or soils that do not allow for infiltration. Operators may find it helpful to consult EPA's Drinking Water Mapping Application to Protect Source Waters (DWMAPS). DWMAPS is an online mapping tool that can be used to locate drinking water providers, potential sources of contamination, polluted waterways, and information on protection initiatives in the site area.

2.2.3 Install sediment controls along any perimeter areas of the site that are downslope from any exposed soil or other disturbed areas.[21]

a. The perimeter control must be installed upgradient of any natural buffers established under Part 2.2.1, unless the control is being implemented pursuant to Part 2.2.1a.ii-iii;

b. To prevent stormwater from circumventing the edge of the perimeter control, install the perimeter control on the contour of the slope and extend both ends of the control up slope (e.g., at 45 degrees) forming a crescent rather than a straight line;

c. After installation, to ensure that perimeter controls continue to work effectively:

i. Remove sediment before it has accumulated to one-half of the above-ground height of any perimeter control; and

ii. After a storm event, if there is evidence of stormwater circumventing or undercutting the perimeter control, extend controls and/or repair undercut areas to fix the problem.

d. Exception. For areas at "linear construction sites" (as defined in Appendix A) where perimeter controls are infeasible (e.g., due to a limited or restricted right-of-way), implement other practices as necessary to minimize pollutant discharges to perimeter areas of the site.

2.2.4 Minimize sediment track-out.

a. Restrict vehicle use to properly designated exit points;

b. Use appropriate stabilization techniques[22] at all points that exit onto paved roads;

i. Exception: Stabilization is not required for exit points at linear utility construction sites that are used only episodically and for very short durations over the life of the project, provided other exit point controls[23] are implemented to minimize sediment track-out;

c. Implement additional track-out controls[24] as necessary to ensure that sediment removal occurs prior to vehicle exit; and

d. Where sediment has been tracked-out from your site onto paved roads, sidewalks, or other paved areas outside of your site, remove the deposited sediment by the end of the same business day in which the track-out occurs or by the end of the next business day if track-out occurs on a non-business day. Remove the track-out by sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal. You are prohibited from hosing or sweeping tracked-out

[21] Examples of perimeter controls include filter berms; different types of silt fence such as wire-backed silt fence, super silt fence, or multi-layer geotextile silt fence; compost filter socks; gravel barriers; and temporary diversion dikes.

[22] Examples of appropriate stabilization techniques include the use of aggregate stone with an underlying geotextile or non-woven filter fabric, and turf mats.

[23] Examples of other exit point controls include preventing the use of exit points during wet periods; minimizing exit point use by keeping vehicles on site to the extent possible; limiting exit point size to the width needed for vehicle and equipment usage; using scarifying and compaction techniques on the soil; and avoiding establishing exit points in environmentally sensitive areas (e.g., *karst areas; steep slopes)*.

[24] Examples of additional track-out controls include the use of wheel washing, rumble strips, and rattle plates.

sediment into any constructed or natural site drainage feature, storm drain inlet, or receiving water.[25]

2.2.5 Manage stockpiles or land clearing debris piles composed, in whole or in part, of sediment and/or soil:[26]

a. Locate the piles outside of any natural buffers established under Part 2.2.1 and away from any constructed or natural site drainage features, storm drain inlets, and areas where stormwater flow is concentrated;

b. Install a sediment barrier along all downgradient perimeter areas of stockpiled soil or land clearing debris piles;[27]

c. For piles that will be unused for 14 or more days, provide cover[28] or appropriate temporary stabilization (consistent with Part 2.2.14);

d. You are prohibited from hosing down or sweeping soil or sediment accumulated on pavement or other impervious surfaces into any constructed or natural site drainage feature, storm drain inlet, or receiving water.

2.2.6 Minimize dust. On areas of exposed soil, minimize dust through the appropriate application of water or other dust suppression techniques to control the generation of pollutants that could be discharged in stormwater from the site.

2.2.7 Minimize steep slope disturbances. Minimize the disturbance of "steep slopes" (as defined in Appendix A).[29]

2.2.8 Preserve native topsoil, unless infeasible.[30]

2.2.9 Minimize soil compaction.[31] In areas of your site where final vegetative stabilization will occur or where infiltration practices will be installed:

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[25] Fine grains that remain visible (e.g., staining) on the surfaces of off-site streets, other paved areas, and sidewalks after you have implemented sediment removal practices are not a violation of Part 2.2.4.

[26] The requirements in Part 2.2.5 do not apply to the storage of rock, such as rip rap, landscape rock, pipe bedding gravel, and boulders. Refer to Part 2.3.3a for the requirements that apply to these types of materials.

[27] Examples of sediment barriers include berms, dikes, fiber rolls, silt fences, sandbags, gravel bags, or straw bale.

[28] Examples of cover include tarps, blown straw and hydroseeding.

[29] Where disturbance to steep slopes cannot be avoided, operators should consider implementing controls suitable for steep slope disturbances that are effective at minimizing erosion and sediment discharge (e.g., preservation of existing vegetation, hydraulic mulch, geotextiles and mats, compost blankets, earth dikes or drainage swales, terraces, velocity dissipation devices). To identify slopes and soil types that are of comparatively higher risk for sediment discharge in areas of the country where the CGP is in effect, operators can use the tables in Appendix F (see Tables F-2 thru F-6).

[30] Stockpiling topsoil at off-site locations, or transferring topsoil to other locations, is an example of a practice that is consistent with the requirements in Part 2.2.8. Preserving native topsoil is not required where the intended function of a specific area of the site dictates that the topsoil be disturbed or removed. For example, some sites may be designed to be highly impervious after construction, and therefore little or no vegetation is intended to remain, or may not have space to stockpile native topsoil on site for later use, in which case it may not be feasible to preserve topsoil.

[31] Minimizing soil compaction is not required where the intended function of a specific area of the site dictates that it be compacted.

a. Restrict vehicle and equipment use in these locations to avoid soil compaction; and

b. Before seeding or planting areas of exposed soil that have been compacted, use techniques that rehabilitate and condition the soils as necessary to support vegetative growth.

2.2.10 Protect storm drain inlets.

a. Install inlet protection measures that remove sediment from discharges prior to entry into any storm drain inlet that carries stormwater from your site to a receiving water, provided you have authority to access the storm drain inlet.[32] Inlet protection measures are not required for storm drain inlets that are conveyed to a sediment basin, sediment trap, or similarly effective control; and

b. Clean, or remove and replace, the inlet protection measures as sediment accumulates, the filter becomes clogged, and/or performance is compromised. Where there is evidence of sediment accumulation adjacent to the inlet protection measure, remove the deposited sediment by the end of the same business day in which it is found or by the end of the following business day if removal by the same business day is not feasible.

2.2.11 Control stormwater discharges, including both peak flowrates and total stormwater volume, to minimize channel and streambank erosion and scour in the immediate vicinity of discharge points.[33]

2.2.12 If you install a sediment basin or similar impoundment:

a. Situate the basin or impoundment outside of any receiving water. and any natural buffers established under Part 2.2.1;

b. Design the basin or impoundment to avoid collecting water from wetlands;

c. Design the basin or impoundment to provide storage for either:

i. The calculated volume of runoff from a 2-year, 24-hour storm;[34] or

ii. 3,600 cubic feet per acre drained.

d. Utilize outlet structures that withdraw water from the surface of the sediment basin or similar impoundment, unless infeasible;[35]

e. Use erosion controls and velocity dissipation devices to prevent erosion at inlets and outlets; and

[32] Inlet protection measures can be removed in the event of flood conditions or to prevent erosion.

[33] Examples of stormwater controls that can be used to comply with this requirement include the use of erosion controls and/or velocity dissipation devices (e.g., check dams, sediment traps), within and along the length of a constructed site drainage feature and at the outfall to slow down stormwater.

[34] Operators may refer to https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates for guidance on determining the volume of precipitation associated with their site's local 2-year, 24-hour storm event.

[35] The circumstances in which it is infeasible to design outlet structures in this manner are rare. Exceptions may include areas with extended cold weather, where using surface outlets may not be feasible during certain time periods (although they must be used during other periods). If you determine that it is infeasible to meet this requirement, you must provide documentation in your SWPPP to support your determination, including the specific conditions or time periods when this exception will apply.

f. Remove accumulated sediment to maintain at least one-half of the design capacity and conduct all other appropriate maintenance to ensure the basin or impoundment remains in effective operating condition.

2.2.13 If using treatment chemicals (e.g., *polymers, flocculants, coagulants*):

a. Use conventional erosion and sediment controls before and after the application of treatment chemicals. Chemicals may only be applied where treated stormwater is directed to a sediment control *(*e.g., *sediment basin, perimeter control)* before discharge.

b. Select appropriate treatment chemicals*.* Chemicals must be appropriately suited to the types of soils likely to be exposed during construction and present in the discharges being treated *(*i.e., *the expected turbidity, pH, and flow rate of stormwater flowing into the chemical treatment system or area)*.

c. Minimize discharge risk from stored chemicals. Store all treatment chemicals in leak-proof containers that are kept under storm-resistant cover and surrounded by secondary containment structures *(*e.g., *spill berms, dikes, spill containment pallets),* or provide equivalent measures designed and maintained to minimize the potential discharge of treatment chemicals in stormwater or by any other means *(*e.g., *storing chemicals in a covered area, having a spill kit available on site and ensuring personnel are available to respond expeditiously in the event of a leak or spill)*.

d. Comply with State/local requirements. Comply with applicable State and local requirements regarding the use of treatment chemicals.

e. Use chemicals in accordance with good engineering practices and specifications of the chemical provider/supplier. Use treatment chemicals and chemical treatment systems in accordance with good engineering practices, and with dosing specifications and sediment removal design specifications provided by the provider/supplier of the applicable chemicals, or document in your SWPPP specific departures from these specifications and how they reflect good engineering practice.

f. Ensure proper training. Ensure all persons who handle and use treatment chemicals at the construction site are provided with appropriate, product-specific training prior to beginning application of treatment chemicals. Among other things, the training must cover proper dosing requirements.

g. Perform additional measures specified by the EPA Regional Office for the authorized use of cationic chemicals. If you have been authorized to use cationic chemicals at your site pursuant to Part 1.1.9, you must perform all additional measures as conditioned by your authorization to ensure the use of such chemicals will not result in discharges that do not meet water quality standards.

2.2.14 Stabilize exposed portions of the site. Implement and maintain stabilization measures (*e.g., seeding protected by erosion controls until vegetation is established,*[36] *sodding, mulching, erosion control blankets, hydromulch, gravel*) that minimize erosion from any areas of exposed soil on the site in accordance with Part.

[36] If you will be evaluating the use of some type of erosion control netting to the site as part of your site stabilization, EPA encourages you to consider employing products that have been shown to minimize

a. Stabilization Deadlines:[37]

Table 2 Deadlines for Initiating and Completing Site Stabilization.

Total Amount of Land Disturbance Occurring At Any One Time[38]	**Deadline**
i. Five acres or less (≤5.0) **Note: this includes sites disturbing more than five acres (>5.0) total over the course of a project, but that limit disturbance at any one time (i.e., *phase the disturbance*) to five acres or less (≤5.0)**	• Initiate the installation of stabilization measures immediately[39] in any areas of exposed soil where construction activities have permanently ceased or will be temporarily inactive for 14 or more calendar days;[40] and • Complete the installation of stabilization measures as soon as practicable, but no later than 14 calendar days

impacts on wildlife. For instance, the U.S. Fish & Wildlife Service provides recommendations on the type of netting practices that are considered "wildlife friendly," including those that use natural fiber or 100 percent biodegradable materials and that use a loose weave with a non-welded, movable jointed netting, as well as those products that are not wildlife friendly including square plastic netting that are degradable (e.g., photodegradable, UV-degradable, oxo-degradable), netting made from polypropylene, nylon, polyethylene, or polyester. Other recommendations include removing the netting product when it is no longer needed. See https://www.fws.gov/midwest/eastlansing/library/pdf/WildlifeFriendlyErosionControlProducts_revised.pdf for further information. There also may be State, Tribal, or local requirements about using wildlife friendly erosion control products.

[37] EPA may determine, based on an inspection carried out under Part 4.8 and corrective actions required under Part 5.3, that the level of sediment discharge on the site makes it necessary to require a faster schedule for completing stabilization. For instance, if sediment discharges from an area of exposed soil that is required to be stabilized are compromising the performance of existing stormwater controls, EPA may require stabilization to correct this problem.

[38] Limiting disturbances to five (5) acres or less at any one time means that at no time during the project do the cumulative earth disturbances exceed five (5) acres. The following examples would qualify as limiting disturbances at any one time to five (5) acres or less:

1. The total area of disturbance for a project is five (5) acres or less.
2. The total area of disturbance for a project will exceed five (5) acres, but the operator ensures that no more than five (5) acres will be disturbed at any one time through implementation of stabilization measures. In this way, site stabilization can be used to "free up" land that can be disturbed without exceeding the five (5)-acre cap to qualify for the 14-day stabilization deadline. For instance, if an operator completes stabilization of two (2) acres of land on a five (5)-acre disturbance, then two (2) additional acres could be disturbed while still qualifying for the longer 14-day stabilization deadline.

[39] The following are examples of activities that would constitute the immediate initiation of stabilization:

1. Prepping the soil for vegetative or non-vegetative stabilization as long as seeding, planting, and/or installation of non-vegetative stabilization products takes place as soon as practicable, but no later than one (1) calendar day of completing soil preparation;
2. Applying mulch or other non-vegetative product to the exposed area;
3. Seeding or planting the exposed area;
4. Starting any of the activities in # 1 – 3 on a portion of the entire area that will be stabilized; and
5. Finalizing arrangements to have stabilization product fully installed in compliance with the deadlines for completing stabilization.

[40] The requirement to initiate stabilization immediately is triggered as soon as you know that construction work on a portion of the site is temporarily ceased and will not resume for 14 or more days, or as soon as you know that construction work is permanently ceased. In the context of this provision, "immediately" means as soon as practicable, but no later than the end of the next business day, following the day when the construction activities have temporarily or permanently ceased.

Total Amount of Land Disturbance Occurring At Any One Time[38]	Deadline
	after stabilization has been initiated.[41]
ii. More than five acres (>5.0)	• Initiate the installation of stabilization measures immediately[42] in any areas of exposed soil where construction activities have permanently ceased or will be temporarily inactive for 14 or more calendar days;[43] and • Complete the installation of stabilization measures as soon as practicable, but no later than seven (7) calendar days after stabilization has been initiated.[44]

b. Exceptions:

i. Arid, semi-arid, and drought-stricken areas (as defined in Appendix A)**.** If it is the seasonally dry period (as defined in Appendix A)[45] or a period in which drought is occurring, and vegetative stabilization measures are being used:

(a) Immediately initiate and, within 14 calendar days of temporary or permanent cessation of work in any portion of your site, complete the installation of temporary non-vegetative stabilization measures to the extent necessary to prevent erosion;

(b) As soon as practicable, given conditions or circumstances on the site, complete all activities necessary to seed or plant the area to be stabilized; and

(c) If construction is occurring during the seasonally dry period, indicate in your SWPPP the beginning and ending dates of the seasonally dry period and your site conditions. Also include the schedule you will follow for initiating and completing vegetative stabilization.

ii. Unforeseen circumstances. Operators that are affected by unforeseen circumstances[46] that delay the initiation and/or completion of vegetative stabilization:

[41] If vegetative stabilization measures are being implemented, stabilization is considered "installed" when all activities necessary to seed or plant the area are completed, including the application of any non-vegetative protective cover (e.g., mulch, erosion control blanket), if applicable. If non-vegetative stabilization measures are being implemented, stabilization is considered "installed" when all such measures are implemented or applied.

[42] See footnote 39.

[43] See footnote 40.

[44] See footnote 41.

[45] The term "seasonally dry period" as defined in Appendix A refers to a month in which the long-term average total precipitation is less than or equal to 0.5 inches. Refer to EPA's Seasonally Dry Period Locator Tool at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates and supporting maps for assistance in determining whether a site is operating during a seasonally dry period for the area.

[46] Examples include problems with the supply of seed stock or with the availability of specialized equipment and unsuitability of soil conditions due to excessive precipitation and/or flooding.

(a) Immediately initiate and, within 14 calendar days, complete the installation of temporary non-vegetative stabilization measures to prevent erosion;

(b) Complete all soil conditioning, seeding, watering or irrigation installation, mulching, and other required activities related to the planting and initial establishment of vegetation as soon as conditions or circumstances allow it on your site; and

(c) Document in the SWPPP the circumstances that prevent you from meeting the deadlines in Part 2.2.14a and the schedule you will follow for initiating and completing stabilization.

iii. Discharges to a sediment- or nutrient-impaired water or to a water that is identified by your State, Tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes. Complete stabilization as soon as practicable, but no later than seven (7) calendar days after stabilization has been initiated.

iv. Discharges to a receiving water located within Lands of Exclusive Federal Jurisdiction. Complete stabilization as soon as practicable, but no later than seven (7) calendar days after stabilization has been initiated. This deadline applies regardless of whether another exception in this section applies to your site.

c. Final Stabilization Criteria (for any areas not covered by permanent structures)**:**

i. Establish uniform, perennial vegetation *(*i.e.*, evenly distributed, without large bare areas)* to provide 70 percent or more of the vegetative cover native to local undisturbed areas; and/or

ii. Implement permanent non-vegetative stabilization measures[47] to provide effective cover of any areas of exposed soil.

iii. Exceptions:

(a) **Arid, semi-arid, and drought-stricken areas** (as defined in Appendix A). Final stabilization is met if the area has been seeded or planted to establish vegetation that provides 70 percent or more of the vegetative cover native to local undisturbed areas within three (3) years and, to the extent necessary to prevent erosion on the seeded or planted area, non-vegetative erosion controls have been applied to provide cover for at least three years without active maintenance.

(b) **Disturbed areas on agricultural land that are restored to their preconstruction agricultural use.** The Part 2.2.14c final stabilization criteria do not apply.

(c) **Areas that need to remain disturbed.** In limited circumstances, stabilization may not be required if the intended function of a specific area of the site necessitates that it remain disturbed, and only the minimum area needed remains disturbed *(*e.g.*, dirt access roads, utility pole pads, areas being used for storage of vehicles, equipment, materials)*.

[47] Examples of permanent non-vegetative stabilization measures include riprap, gravel, gabions, and geotextiles.

2.3 POLLUTION PREVENTION REQUIREMENTS[48]

You must implement pollution prevention controls in accordance with the following requirements to minimize the discharge of pollutants in stormwater and to prevent the discharge of pollutants from spilled or leaked materials from construction activities.

2.3.1 For equipment and vehicle fueling and maintenance:

a. Provide an effective means of eliminating the discharge of spilled or leaked chemicals, including fuels and oils, from these activities;[49]

b. If applicable, comply with the Spill Prevention Control and Countermeasures (SPCC) requirements in 40 CFR part 112 and Section 311 of the CWA;

c. Ensure adequate supplies are available at all times to handle spills, leaks, and disposal of used liquids;

d. Use drip pans and absorbents under or around leaky vehicles;

e. Dispose of or recycle oil and oily wastes in accordance with other Federal, State, Tribal, or local requirements; and

f. Clean up spills or contaminated surfaces immediately, using dry clean up measures (do not clean contaminated surfaces by hosing the area down), and eliminate the source of the spill to prevent a discharge or a continuation of an ongoing discharge.

2.3.2 For equipment and vehicle washing:

a. Provide an effective means of minimizing the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other types of wash waters;[50]

b. Ensure there is no discharge of soaps, solvents, or detergents in equipment and vehicle wash water; and

c. For storage of soaps, detergents, or solvents, provide either (1) cover *(*e.g., *plastic sheeting, temporary roofs)* to minimize the exposure of these detergents to precipitation and to stormwater, or (2) a similarly effective means designed to minimize the discharge of pollutants from these areas.

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[48] Under this permit, you are not required to minimize exposure for any products or materials where the exposure to precipitation and to stormwater will not result in a discharge of pollutants, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use).

[49] Examples of effective means include:

- Locating activities away from receiving waters, storm drain inlets, and constructed or natural site drainage feature so that stormwater coming into contact with these activities cannot reach waters of the U.S.;
- Providing secondary containment (e.g., *spill berms, dikes, spill containment pallets*) and cover where appropriate; and
- Having a spill kit available on site and ensuring personnel are available to respond expeditiously in the event of a leak or spill.

[50] Examples of effective means include locating activities away from receiving waters and storm drain inlets or constructed or natural site drainage features and directing wash waters to a sediment basin or sediment trap, using filtration devices, such as filter bags or sand filters, or using other similarly effective controls.

2.3.3 For storage, handling, and disposal of building products, materials, and wastes:[51]

a. *For building materials and building products*,[52] provide either (1) cover (e.g., *plastic sheeting, temporary roofs*) to minimize the exposure of these products to precipitation and to stormwater, or (2) a similarly effective means designed to minimize the discharge of pollutants from these areas.

Exception: Minimization of exposure is not required in cases where the exposure to precipitation and to stormwater will not result in a discharge of pollutants, or where exposure of a specific material or product poses little risk of stormwater contamination (such as final products and materials intended for outdoor use).

b. *For pesticides, herbicides, insecticides, fertilizers, and landscape materials:*

i. In storage areas, provide either (1) cover (e.g., *plastic sheeting, temporary roofs*) to minimize the exposure of these chemicals to precipitation and to stormwater, or (2) a similarly effective means designed to minimize the discharge of pollutants from these areas; and

ii. Comply with all application and disposal requirements included on the registered pesticide, herbicide, insecticide, and fertilizer label (see also Part 2.3.5).

c. *For diesel fuel, oil, hydraulic fluids, other petroleum products, and other chemicals:* The following requirements apply to the storage and handling of chemicals on your site. If you are already implementing controls as part of an SPCC or other spill prevention plan that meet or exceed the requirements of this Part, you may continue to do so and be considered in compliance with these provisions provided you reference the applicable parts of the SPCC or other plans in your SWPPP as required in Part 7.2.6b.viii.

i. If any chemical container has a storage capacity of less than 55 gallons:

(a) The containers must be water-tight, and must be kept closed, sealed, and secured when not being actively used;

(b) If stored outside, use a spill containment pallet or similar device to capture small leaks or spills; and

(c) Have a spill kit available on site that is in good working condition (i.e., not damaged, expired, or used up) and ensure personnel are available to respond immediately in the event of a leak or spill.

ii. If any chemical container has a storage capacity of 55 gallons or more:

(a) The containers must be water-tight, and must be kept closed, sealed, and secured when not being actively used;

(b) Store containers a minimum of 50 feet from receiving waters, constructed or natural site drainage features, and storm drain inlets. If infeasible due to site constraints, store containers as far away from these features as the site

[51] Compliance with the requirements of this permit does not relieve compliance requirements with respect to Federal, State, or local laws and regulations governing the storage, handling, and disposal of solid, hazardous, or toxic wastes and materials.

[52] Examples of building materials and building products typically present at construction sites include asphalt sealants, copper flashing, roofing materials, adhesives, concrete admixtures, and gravel and mulch stockpiles.

permits. If site constraints prevent you from storing containers 50 feet away from receiving waters or the other features identified, you must document in your SWPPP the specific reasons why the 50-foot setback is infeasible, and how you will store containers as far away as the site permits;

(c) Provide either (1) cover (e.g., temporary roofs) to minimize the exposure of these containers to precipitation and to stormwater, or (2) secondary containment (e.g., curbing, spill berms, dikes, spill containment pallets, double-wall, above-ground storage tank); and

(d) Have a spill kit available on site that is in good working condition (i.e., not damaged, expired, or used up) and ensure personnel are available to respond immediately in the event of a leak or spill. Additional secondary containment measures are listed at 40 CFR § 112.7(c)(1).

iii. Clean up spills immediately, using dry clean-up methods where possible, and dispose of used materials properly. You are prohibited from hosing the area down to clean surfaces or spills. Eliminate the source of the spill to prevent a discharge or a furtherance of an ongoing discharge.

d. *For hazardous or toxic wastes:*[53]

i. Separate hazardous or toxic waste from construction and domestic waste;

ii. Store waste in sealed containers, constructed of suitable materials to prevent leakage and corrosion, and labeled in accordance with applicable Resource Conservation and Recovery Act (RCRA) requirements and all other applicable Federal, State, Tribal, or local requirements;

iii. Store all outside containers within appropriately-sized secondary containment (e.g., *spill berms, dikes, spill containment pallets*) to prevent spills from being discharged, or provide a similarly effective means designed to prevent the discharge of pollutants from these areas *(*e.g., *storing chemicals in a covered area, having a spill kit available on site);*

iv. Dispose of hazardous or toxic waste in accordance with the manufacturer's recommended method of disposal and in compliance with Federal, State, Tribal, and local requirements;

v. Clean up spills immediately, using dry clean-up methods, and dispose of used materials properly. You are prohibited from hosing the area down to clean surfaces or spills. Eliminate the source of the spill to prevent a discharge or a furtherance of an ongoing discharge; and

vi. Follow all other Federal, State, Tribal, and local requirements regarding hazardous or toxic waste.

e. *For construction and domestic wastes:*[54]

[53] Examples of hazardous or toxic waste that may be present at construction sites include paints, caulks, sealants, fluorescent light ballasts, solvents, petroleum-based products, wood preservatives, additives, curing compounds, and acids.

[54] Examples of construction and domestic wastes include packaging materials, scrap construction materials, masonry products, timber, pipe and electrical cuttings, plastics, styrofoam, concrete, demolition debris; and other trash or discarded materials.

i. Provide waste containers *(*e.g., *dumpster, trash receptacle)* of sufficient size and number to contain construction and domestic wastes;

(a) For waste containers with lids, keep waste container lids closed when not in use, and close lids at the end of the business day and during storm events. For waste containers without lids, provide either (1) cover *(*e.g., *a tarp, plastic sheeting, temporary roof)* to minimize exposure of wastes to precipitation, or (2) a similarly effective means designed to minimize the discharge of pollutants *(*e.g., *secondary containment);*

(b) On business days, clean up and dispose of waste in designated waste containers; and

(c) Clean up immediately if containers overflow, and if there is litter elsewhere on the site from escaped trash.

ii. Waste containers are not required for the waste remnant or unused portions of construction materials or final products that are covered by the exception in Part 2.2.3a provided that:

(a) These wastes are stored separately from other construction or domestic wastes addressed by Part 2.3.3e.i (i.e., wastes not covered by the exception in Part 2.3.3a). If the wastes are mixed, they must be stored in waste containers as required in Part 2.3.3e.i; and

(b) These wastes are stored in designated areas of the site, the wastes are described in the SWPPP (see Part 7.2.6b.ix), and identified in the site plan (see Part 7.2.4i).

f. *For sanitary waste*, position portable toilets so they are secure and will not be tipped or knocked over, and are located away from receiving waters, storm drain inlets, and constructed or natural site drainage features.

2.3.4 For washing applicators and containers used for stucco, paint, concrete, form release oils, curing compounds, or other materials:

a. Direct wash water into a leak-proof container or leak-proof and lined pit designed so no overflows can occur due to inadequate sizing or precipitation;

b. Handle washout or cleanout wastes as follows:

i. For liquid wastes:

(a) Do not dump liquid wastes or allow them to enter into constructed or natural site drainage features, storm inlets, or receiving waters;

(b) Do not allow liquid wastes to be disposed of through infiltration or to otherwise be disposed of on the ground;

(c) Comply with applicable State, Tribal, or local requirements for disposal

ii. Remove and dispose of hardened concrete waste consistent with your handling of other construction wastes in Part 2.3.3e; and

c. Locate any washout or cleanout activities as far away as possible from receiving waters, constructed or natural site drainage features, and storm drain inlets, and, to the extent feasible, designate areas to be used for these activities and conduct such activities only in these areas.

2.3.5 For the application of fertilizers:

a. Apply at a rate and in amounts consistent with manufacturer's specifications, or document in the SWPPP departures from the manufacturer specifications where appropriate in accordance with Part 7.2.6b.x;

b. Apply at the appropriate time of year for your location, and preferably timed to coincide as closely as possible to the period of maximum vegetation uptake and growth;

c. Avoid applying before heavy rains that could cause excess nutrients to be discharged;

d. Never apply to frozen ground;

e. Never apply to constructed or natural site drainage features; and

f. Follow all other Federal, State, Tribal, and local requirements regarding fertilizer application.

2.3.6 Emergency Spill Notification Requirements

Discharges of toxic or hazardous substances from a spill or other release are prohibited, consistent with Part 1.3.5. Where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR part 110, 40 CFR part 117, or 40 CFR part 302 occurs during a 24-hour period, you must notify the National Response Center (NRC) at (800) 424-8802 or, in the Washington, DC metropolitan area, call (202) 267-2675 in accordance with the requirements of 40 CFR part 110, 40 CFR part 117, and 40 CFR part 302 as soon as you have knowledge of the release. You must also, within seven (7) calendar days of knowledge of the release, provide a description of the release, the circumstances leading to the release, and the date of the release. State, Tribal, or local requirements may necessitate additional reporting of spills or discharges to local emergency response, public health, or drinking water supply agencies.

2.4 CONSTRUCTION DEWATERING REQUIREMENTS

Comply with the following requirements to minimize the discharge of pollutants from dewatering[55] operations.

2.4.1 Route dewatering water through a sediment control (e.g., sediment trap or basin, pumped water filter bag) designed to prevent discharges with visual turbidity; [56]

2.4.2 Do not discharge visible floating solids or foam;

2.4.3 The discharge must not cause the formation of a visible sheen on the water surface, or visible oily deposits on the bottom or shoreline of the receiving water. Use an oil-water separator or suitable filtration device (such as a cartridge filter) designed to remove oil, grease, or other products if dewatering water is found to or expected to contain these materials;

[55] "Dewatering" is defined in Appendix A as "the act of draining accumulated stormwater and/or ground water from building foundations, vaults, and trenches, or other similar points of accumulation."

[56] For the purposes of this permit, visual turbidity is present where there is a sediment plume in the discharge or the discharge appears cloudy, or opaque, or has a visible contrast that can be identified by an observer.

2.4.4 To the extent feasible, use well-vegetated (e.g., grassy or wooded), upland areas of the site to infiltrate dewatering water before discharge.[57] You are prohibited from using receiving waters as part of the treatment area;

2.4.5 To prevent dewatering-related erosion and related sediment discharges:

a. Use stable, erosion-resistant surfaces (e.g., well-vegetated grassy areas, clean filter stone, geotextile underlayment) to discharge from dewatering controls;

b. Do not place dewatering controls, such as pumped water filter bags, on steep slopes (as defined in Appendix A); and

c. At all points where dewatering water is discharged, comply with the velocity dissipation requirements of Part 2.2.11.

2.4.6 For backwash water, either haul it away for disposal or return it to the beginning of the treatment process;

2.4.7 Replace and clean the filter media used in dewatering devices when the pressure differential equals or exceeds the manufacturer's specifications; and

2.4.8 Comply with dewatering-specific inspection requirements in Part 4.

3 WATER QUALITY-BASED EFFLUENT LIMITATIONS

3.1 GENERAL EFFLUENT LIMITATION TO MEET APPLICABLE WATER QUALITY STANDARDS

Discharges must be controlled as necessary to meet applicable water quality standards. Discharges must also comply with any additional State or Tribal requirements that are in Part 9.

In the absence of information demonstrating otherwise, EPA expects that compliance with the conditions in this permit will result in stormwater discharges being controlled as necessary to meet applicable water quality standards. If at any time you become aware, or EPA determines, that discharges are not being controlled as necessary to meet applicable water quality standards, you must take corrective action as required in Parts 5.1 and 5.2, and document the corrective actions as required in Part 5.4.

EPA may insist that you install additional controls (to meet the narrative water quality-based effluent limit above) on a site-specific basis, or require you to obtain coverage under an individual permit, if information in your NOI or from other sources indicates that your discharges are not controlled as necessary to meet applicable water quality standards. This includes situations where additional controls are necessary to comply with a wasteload allocation in an EPA-established or approved TMDL.

If during your coverage under a previous permit, you were required to install and maintain stormwater controls specifically to meet the assumptions and requirements of an EPA-approved or established TMDL (for any parameter) or to otherwise control your discharge to meet water quality standards, you must continue to implement such controls as part of your coverage under this permit.

3.2 WATER QUALITY-BASED CONDITIONS FOR SITES DISCHARGING TO CERTAIN IMPAIRED AND HIGH QUALITY RECEIVING WATERS

For any portion of the site that discharges to a sediment or nutrient-impaired water or to a water that is identified by your State, Tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 for

[57] See footnote 20.

antidegradation purposes,[58] you must comply with the inspection frequency specified in Part 4.3 and you must comply with the stabilization deadline specified in Part 2.2.14b.iii.[59]

If you discharge to a water that is impaired for a parameter other than a sediment-related parameter or nutrients, EPA will inform you if any additional controls are necessary for your discharge to be controlled as necessary to meet water quality standards. These controls might include those necessary for your discharge to be consistent with the assumptions of any available wasteload allocation in any applicable TMDL. In addition, EPA may require you to apply for and obtain coverage under an individual NPDES permit.

In addition, on a case-by-case basis, EPA may notify operators of new sites or operators of existing sites with increased discharges that additional analyses, stormwater controls, and/or other measures are necessary to comply with the applicable antidegradation requirements, or notify you that an individual permit application is necessary.

If you discharge to a water that is impaired for polychlorinated biphenyls (PCBs) and are engaging in demolition of any structure with at least 10,000 square feet of floor space built or renovated before January 1, 1980, you must:

a. Implement controls[60] to minimize the exposure of PCB-containing building materials, including paint, caulk, and pre-1980 fluorescent lighting fixtures, to precipitation and to stormwater; and

b. Ensure that disposal of such materials is performed in compliance with applicable State, Federal, and local laws.

3.3 TURBIDITY BENCHMARK MONITORING FOR SITES DISCHARGING DEWATERING WATER TO PROTECT THE WATER QUALITY OF SENSITIVE WATERS

For sites discharging dewatering water to "sensitive waters" (i.e., receiving waters listed as impaired for sediment or a sediment-related parameter (as defined in Appendix A), receiving waters designated as a Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes, or receiving waters located within Lands of Exclusive Federal Jurisdiction) you are required to comply with the benchmark monitoring requirements in this Part and document the procedures you will use at your site in your SWPPP pursuant to Part 7.2.8. A summary of these requirements is included in Table 1.

EPA notes that the benchmark threshold is not an effluent limitation, rather it is an indicator that the dewatering controls may not be working to protect water quality, which the operator must investigate and correct as appropriate. A benchmark exceedance is not a permit violation. However, if a benchmark exceedance triggers

[58] Refer to Appendix A for definitions of "impaired water" and "Tier 2," "Tier 2.5," and "Tier 3" waters. For assistance in determining whether your site discharges to impaired waters, EPA has developed a tool that is available at https://www.epa.gov/npdes/epas-stormwater-discharge-mapping-tools. For assistance in determining whether your site discharges to a Tier 2, 2.5, or 3 water, refer to the list of such waters at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates.

[59] If you qualify for any of the reduced inspection frequencies in Part 4.4, you may conduct inspections in accordance with Part 4.4 for any portion of your site that discharges to a sensitive water.

[60] Examples of controls to minimize exposure of PCBs to precipitation and stormwater include separating work areas from non-work areas and selecting appropriate personal protective equipment and tools, constructing a containment area so that all dust or debris generated by the work remains within the protected area, and using tools that minimize dust and heat (<212°F). For additional information, refer to Part 2.3.3 of the CGP Fact Sheet.

corrective action in Part 5.1.5a, failure to conduct any required action is a permit violation.

Where there are multiple operators associated with the same site, the operators may coordinate with one another to carry out the monitoring requirements of this Part in order to avoid duplicating efforts. Such coordinating arrangements must be described in the SWPPP consistent with Part 7.2.8. Regardless of how the operators divide the responsibilities for monitoring and reporting, each operator remains responsible for compliance with these requirements.[61]

3.3.1 Turbidity monitoring requirements[62]

a. Sampling frequency. You must collect at least one turbidity sample from your dewatering discharge each day a discharge occurs.

b. Sampling location. Samples must be taken at all points where dewatering water is discharged. Samples must be taken after the dewatering water has been treated by installed treatment devices pursuant to Parts 2.4.1 and 2.4.3 and prior to its discharge off site into a receiving water, constructed or natural site drainage feature, or storm drain inlet.

c. Representative samples. Samples taken must be representative of the dewatering discharge for any given day as required in Appendix G (standard permit conditions), Part G.10.2.

d. Test methods. Samples must be measured using a turbidity meter that reports results in nephelometric turbidity units (NTUs) and conforms with a Part 136-approved method (e.g., methods 180.1 and 2130). You are required to use the meter, and conduct a calibration verification prior to each day's use, consistent with the manufacturer's instructions.

3.3.2 Turbidity benchmark

a. The benchmark threshold for turbidity for this permit is 50 NTUs (referred to elsewhere in this permit as the "standard 50 NTU benchmark") unless EPA has authorized the use of an alternate benchmark in accordance with Part 3.3.2b.

b. Request for alternate benchmark threshold.

i. At any time prior to or during your coverage under this permit, you may request that EPA approve a benchmark for your site that is higher than 50 NTUs if you

[61] For instance, if Operator A relies on Operator B to meet the Part 3.3.1 turbidity monitoring requirements, the Part 3.3.4 reporting and recordkeeping requirements, and the Part 5.2.2 corrective action provisions when applicable, Operator A does not have to duplicate these same functions if Operator B is implementing them for both operators to be in compliance with the permit. However, Operator A remains responsible for complying with these permit requirements if Operator B fails to take actions that were necessary for Operator A to comply with the permit. See also footnote 84. EPA notes that both Operator A and B are required to submit turbidity monitoring reports as required under Part 3.3.4, however, Operator A's report does not need to include the data collected by Operator B as long as Operator B submits the required data and Operator A's report indicates that it is relying on Operator B to report the data. See Part 3.3.4a.

[62] Operators may find it useful to consult EPA's *Monitoring and Inspection Guide for Construction Dewatering*, available at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates, which provides guidelines on how to correctly monitor for turbidity, determine if the weekly average exceeds the benchmark, and, if so, how to proceed with corrective action.

have information demonstrating the higher number is the same as your receiving water's water quality standard for turbidity. Unless EPA approves an alternate benchmark, you will be required to use the standard 50 NTU benchmark. To request approval of an alternate benchmark, you must submit the following information to your applicable EPA Regional Office (see Appendix K):

(a) The current turbidity water quality standard that applies to your receiving water and the source/citation.[63]

(b) If the applicable turbidity water quality standard requires information on natural or background turbidity levels (e.g., "no more than 10 NTU above natural turbidity levels") to determine the specific standard for the receiving water, include available data that can be used to establish the natural turbidity levels of your receiving water (including literature studies or Federal, State, Tribal, or local government data). Data must be representative of the natural turbidity levels of your specific receiving water. Identify the source(s) of all data provided, including if the data are from samples you collected of the receiving water.

ii. EPA will inform you of its decision on whether to approve the requested alternate benchmark within 30 days. EPA may approve your request, request additional time (e.g., if additional information is needed to substantiate the data you provided), or deny your request. Unless and until EPA approves your request to use an alternate benchmark, you are required to use the standard benchmark of 50 NTUs and take any required corrective actions if an exceedance occurs.

3.3.3 Comparison of turbidity samples to benchmark. Compare the weekly average[64] of your turbidity monitoring results to the standard 50 NTU benchmark, or alternate benchmark if approved by EPA.

a. If the weekly average of your turbidity monitoring results exceeds the standard benchmark (or your approved alternate benchmark), you are required to conduct follow-up corrective action in accordance with Part 5.2.2 and document any corrective action taken in your corrective action log in accordance with Part 5.4.

b. For averaging purposes, a "monitoring week" starts with a Monday and ends on Sunday. Once a new monitoring week starts, you will need to calculate a new average for that week of turbidity monitoring results.[65] A weekly average may consist

[63] For instance, if your site is located in Washington, DC, and you are discharging to a Class B water, for which the water quality standard is that turbidity may not increase above ambient levels by more than 20 percent, you would reference "Water Quality Standards for the District of Columbia, Chapter 11, Section 1104.8."

[64] A "weekly average" is defined as the sum of all of the turbidity samples taken during a "monitoring week" divided by the number of samples measured during that week. Average values should be calculated to the nearest whole number.

[65] For example, if turbidity samples from your dewatering discharge in week 1 result in values of 30 NTU on Tuesday, 40 NTU on Wednesday, and 45 NTU on Thursday, your weekly average turbidity value would be 38.33 NTU ((30+40+45) ÷ 3 = 38 NTU). If in week 2, your turbidity samples resulted in values of 45 NTU on Monday, 30 NTU on Tuesday, 25 NTU on Wednesday, and 15 NTU on Thursday, you would calculate a new average for that week, which would yield an average turbidity value of 28.75 NTU ((45+30+25+15) ÷ 4 = 29 NTU). By comparison, if your samples on consecutive days from Friday to Monday were 60 NTU, 45 NTU, 40

of one or more turbidity monitoring results.

c. Although you are not required to collect and analyze more than one turbidity sample per day from your dewatering discharge, if you do collect and analyze more than one sample on any given day, you must include any additional results in the calculation of your weekly average (i.e., add all individual results for that monitoring week and divide by the total number of samples).[66]

d. If you are conducting turbidity monitoring for more than one dewatering discharge point, you must calculate a weekly average turbidity value for each discharge point and compare each to the turbidity benchmark.

3.3.4 Reporting and recordkeeping.

a. You must submit reports of your weekly average turbidity data to EPA no later than 30 days following the end of each monitoring quarter. If there are monitoring weeks in which there was no dewatering discharge, or if there is a monitoring quarter with no dewatering discharge, indicate this in your turbidity monitoring report. If another operator associated with your same site is conducting turbidity monitoring on your behalf pursuant to Part 3.3, indicate this in your turbidity monitoring report.

b. For the purposes of this permit, the following monitoring quarters and reporting deadlines apply:

Table 3. Monitoring Quarters and Deadlines for Reporting Turbidity Benchmark Monitoring Data.

Monitoring Quarter #	**Months**	**Reporting Deadline** (no later than 30 days after end of the monitoring quarter)
1	January 1 – March 31	April 30
2	April 1 – June 30	July 30
3	July 1 – September 30	October 30
4	October 1 – December 31	January 30

c. You must use EPA's NPDES eReporting Tool (NeT) to electronically submit your quarterly turbidity data, unless, consistent with Part 1.4.2, you received a waiver from your applicable EPA Regional Office. If the EPA Regional Office grants you approval to use a paper turbidity monitoring report form, and you elect to use it, you must complete the form in Appendix K. If EPA approves of your request to use an alternate turbidity benchmark pursuant to Part 3.3.2b, EPA will substitute the alternate benchmark in your NeT account.

d. For each day in which you are required to monitor, you must record the monitoring information required by Appendix G, Parts G.10.2 and G.10.3 and retain all such information for a period of at least three years from the date this permit expires or

NTU, and 43 NTU, respectively, and there are no other dewatering discharges for the remainder of the week, you would calculate one weekly average for the Friday to Sunday to be 48 NTU ((60+45+40) ÷ 3 = 48 NTU), and a separate weekly average for the one Monday to be 43 NTU (43 ÷ 1 = 43 NTU).

[66] For example, if during a monitoring week you take two turbidity samples on Tuesday with a value of 30 NTU and 35 NTU, three samples on Wednesday with a value of 40 NTU, 45 NTU, and 48 NTU, and one sample on Thursday with a value of 45 NTU, your weekly average turbidity value for this week would be 41 NTU ((30+35+40+45+48+45) ÷ 6 = 41 NTU).

from the date your authorization is terminated.

Table 4. Summary of Turbidity Benchmark Monitoring Requirements.

Applicability	Sampling Requirement	Turbidity Benchmark	Corrective Action	Reporting
Sites discharging dewatering water to a sediment-impaired water, to a water designated as a Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes, or to receiving waters located within Lands of Exclusive Federal Jurisdiction.	Collect at least one turbidity sample per day, from each discharge point, on any day there is a dewatering discharge. Use turbidity sampling procedures specified in Part 3.3.1.	Compare the weekly average of your turbidity monitoring results to the 50 NTU benchmark (or alternate benchmark if approved by EPA).	If the weekly average of turbidity monitoring results exceeds the 50 NTU turbidity benchmark (or alternate benchmark if approved by EPA), you are required to take follow-up corrective action in accordance with Part 5.2.2.	Report all weekly average turbidity monitoring results on a quarterly basis via NeT-CGP (unless use of the paper monitoring form in Appendix K is approved by EPA) no later than 30 days following the end of each monitoring quarter.

4 INSPECTION REQUIREMENTS

4.1 PERSON(S) RESPONSIBLE FOR CONDUCTING SITE AND DEWATERING INSPECTIONS

The person(s) inspecting your site may be a person on your staff or a third party you hire to conduct such inspections. You are responsible for ensuring that any person conducting inspections pursuant to this Part is a "qualified person." A qualified person is someone who has completed the training required by Part 6.3.

4.2 FREQUENCY OF INSPECTIONS.[67]

At a minimum, you must conduct a site inspection in accordance with one of the two schedules listed below, unless you are subject to the Part 4.3 site inspection frequency for discharges to sediment or nutrient-impaired or high quality waters, or qualify for a Part 4.4 reduction in the inspection frequency:

4.2.1 At least once every seven (7) calendar days; *or*

4.2.2 Once every 14 calendar days *and* within 24 hours[68] of the occurrence of:

- **a.** A storm event that produces 0.25 inches or more of rain within a 24-hour period.
  - **i.** If a storm event produces 0.25 inches or more of rain within a 24-hour period (including when there are multiple, smaller storms that alone produce less than

[67] Inspections are only required during the site's normal working hours.

[68] For the purposes of the inspection requirements in this Part, conducting an inspection "within 24 hours" means that once either of the two conditions in Parts 4.2.2a or 4.2.2b are met you have 24 hours from that time to conduct an inspection. For clarification, the 24 hours is counted as a continuous passage of time, and not counted by business hours (e.g., 3 business days of 8 hours each). When the 24-hour inspection time frame occurs entirely outside of normal working hours, you must conduct an inspection by no later than the end of the next business day.

0.25 inches but together produce 0.25 inches or more in 24 hours), you are required to conduct one inspection within 24 hours of when 0.25 inches of rain or more has fallen.

ii. If a storm event produces 0.25 inches or more of rain within a 24-hour period on the first day of a storm and continues to produce 0.25 inches or more of rain on subsequent days, you must conduct an inspection within 24 hours of the first day of the storm and within 24 hours after the last day of the storm that produces 0.25 inches or more of rain (i.e., only two inspections would be required for such a storm event).[69]

b. A discharge caused by snowmelt from a storm event that produces 3.25 inches[70] or more of snow within a 24-hour period. You are required to conduct one inspection once the discharge of snowmelt from a 3.25-inch or more snow accumulation occurs. Additional snowmelt inspections are only required if following the discharge from the first snowmelt, there is a discharge from a separate storm event that produces 3.25 inches or more of snow.

4.2.3 To determine whether a storm event meets either of the thresholds in Parts 4.2.2a or 4.2.2b:

a. For rain, you must either keep a properly maintained rain gauge on your site, or obtain the storm event information from a weather station that is representative of your location. For any 24-hour period during which there is 0.25 inches or more of rainfall, you must record the total rainfall measured for that day in accordance with Part 4.7.1d.

b. For snow, you must either take measurements of snowfall at your site,[71] or rely on similar information from a local weather forecasting provider that is representative of your location.

4.3 INCREASE IN INSPECTION FREQUENCY FOR CERTAIN SITES.

The increased inspection frequencies established in this Part take the place of the Part 4.2 inspection frequencies for the portion of the site affected.

4.3.1 For any portion of the site that discharges to a sediment or nutrient-impaired water or to a water that is identified by your State, Tribe, or EPA as Tier 2, Tier 2.5, or Tier 3 for antidegradation purposes (see Part 3.2), or that discharges to receiving waters located within Lands of Exclusive Federal Jurisdiction, you must conduct an inspection once every seven (7) calendar days *and* within 24 hours of the occurrence of a storm event

[69] For example, if 0.30 inches of rain falls on Day 1, 0.25 inches of rain falls on Day 2, and 0.10 inches of rain fall on Day 3, you would be required to conduct a first inspection within 24 hours of the Day 1 rainfall and a second inspection within 24 hours of the Day 2 rainfall, but a third inspection would not be required within 24 hours of the Day 3 rainfall.

[70] This is the amount of snow that is equivalent to 0.25 inches of rain, based on information from the National Oceanic and Atmospheric Administration (NOAA) indicating that 13 inches of snow is, on average, equivalent to 1 inch of rain. See https://www.nssl.noaa.gov/education/svrwx101/winter/faq/.

[71] For snowfall measurements, EPA suggests use of NOAA's National Weather Service guidelines at https://www.weather.gov/jkl/snow_measurement. These guidelines recommend use of a "snowboard" (a piece of wood about 16 inches by 16 inches) that is placed in an unobstructed part of the site on a hard surface.

that produces 0.25 inches or more of rain within a 24-hour period, or within 24 hours of a snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period.

Refer to Parts 4.2.3a and 4.2.3b for the requirements to determine if a storm event produces enough rain or snow to trigger the inspection requirement.

4.3.2 For sites discharging dewatering water, you must conduct an inspection in accordance with Part 4.6.3 during the discharge once per day on which the discharge occurs. The Part 4.2 inspection frequency still applies to all other portions of the site, unless the site is affected by either the increased frequency in Part 4.3.1 or the reduced frequency in Part 4.4.

4.4 REDUCTIONS IN INSPECTION FREQUENCY

4.4.1 Stabilized areas.

a. You may reduce the frequency of inspections to twice per month for the first month, no more than 14 calendar days apart, then once per month until permit coverage is terminated consistent with Part 8 in any area of your site where the stabilization steps in Part 2.2.14a have been completed. If construction activity resumes in this portion of the site at a later date, the inspection frequency immediately increases to that required in Parts 4.2 and 4.3, as applicable. You must document the beginning and ending dates of this period in your SWPPP.

b. Exception. For "linear construction sites" (as defined in Appendix A) where disturbed portions have undergone final stabilization at the same time active construction continues on others, you may reduce the frequency of inspections to twice per month for the first month, no more than 14 calendar days apart, in any area of your site where the stabilization steps in Part 2.2.14a have been completed. After the first month, inspect once more within 24 hours of the occurrence of a storm event that produces 0.25 inches of rain or more within a 24-hour period, or within 24 hours of a snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period. If there are no issues or evidence of stabilization problems, you may suspend further inspections. If "wash-out" of stabilization materials and/or sediment is observed, following re-stabilization, inspections must resume at the inspection frequency required in Part 4.4.1a. Inspections must continue until final stabilization is visually confirmed following a storm event that produces 0.25 inches of rain or more within a 24-hour period.

4.4.2 Arid, semi-arid, or drought-stricken areas (as defined in Appendix A). If it is the seasonally dry period[72] or a period in which drought is occurring, you may reduce the frequency of inspections to once per month and within 24 hours of the occurrence of a storm event that produces 0.25 inches of rain or more within a 24-hour period, or within 24 hours of a snowmelt discharge from a storm event that produces 3.25 inches or more of snow within a 24-hour period. You must document that you are using this reduced schedule and the beginning and ending dates of the seasonally dry period in your SWPPP. Follow the procedures in Part 4.2.3a and 4.2.3b, accordingly, to determine if a storm event occurs that produces 0.25 inches or more of rain or 3.25 inches or more of snow within a 24-hour period. For any 24-hour period during which there is 0.25 inches or more of rainfall, or 3.25

[72] See footnote 45.

inches or more of snow, you must record the total rainfall or snow measured for that day in accordance with Part 4.7.1d.

4.4.3 Frozen conditions:

a. If you are suspending construction activities due to frozen conditions, you may temporarily suspend inspections on your site until thawing conditions (as defined in Appendix A) begin to occur if:

i. Discharges are unlikely due to continuous frozen conditions that are likely to continue at your site for at least three (3) months based on historic seasonal averages.[73] If unexpected weather conditions (such as above freezing temperatures or rain events) make discharges likely, you must immediately resume your regular inspection frequency as described in Parts 4.2 and 4.3, as applicable;

ii. Land disturbances have been suspended; and

iii. All disturbed areas of the site have been stabilized in accordance with Part 2.2.14a.

b. If you are still conducting construction activities during frozen conditions, you may reduce your inspection frequency to once per month if:

i. Discharges are unlikely due to continuous frozen conditions that are likely to continue at your site for at least three (3) months based on historic seasonal averages. If unexpected weather conditions (such as above freezing temperatures or rain events) make discharges likely, you must immediately resume your regular inspection frequency as described in Parts 4.2 and 4.3, as applicable; and

ii. Except for areas in which you are actively conducting construction activities, disturbed areas of the site have been stabilized in accordance with Part 2.2.14a.

You must document the beginning and ending dates of this period in your SWPPP.

4.5 AREAS THAT MUST BE INSPECTED

During your site inspection, you must at a minimum inspect the following areas of your site:

4.5.1 All areas that have been cleared, graded, or excavated and that have not yet completed stabilization consistent with Part 2.2.14a;

4.5.2 All stormwater controls, including pollution prevention controls, installed at the site to comply with this permit;[74]

4.5.3 Material, waste, borrow, and equipment storage and maintenance areas that are covered by this permit;

4.5.4 All areas where stormwater typically flows within the site, including constructed or natural site drainage features designed to divert, convey, and/or treat stormwater;

[73] Use data sets that include the most recent data available to account for recent precipitation patterns and trends.

[74] This includes the requirement to inspect for sediment that has been tracked out from the site onto paved roads, sidewalks, or other paved areas consistent with Part 2.2.4.

4.5.5 All areas where construction dewatering is taking place, including controls to treat the dewatering discharge and any channelized flow of water to and from those controls;

4.5.6 All points of discharge from the site; and

4.5.7 All locations where stabilization measures have been implemented.

You are not required to inspect areas that, at the time of the inspection, are considered unsafe to your inspection personnel.

4.6 REQUIREMENTS FOR INSPECTIONS

4.6.1 During each site inspection, you must at a minimum:

a. Check whether all stormwater controls *(*i.e.*, erosion and sediment controls and pollution prevention controls)* are properly installed, appear to be operational, and are working as intended to minimize pollutant discharges.

b. Check for the presence of conditions that could lead to spills, leaks, or other accumulations of pollutants on the site.

c. Identify any locations where new or modified stormwater controls are necessary to meet the requirements of Parts 2 and/or 3.

d. Check for signs of visible erosion and sedimentation *(*i.e.*, sediment deposits)* that have occurred and are attributable to your discharge at points of discharge and, if applicable, on the banks of any receiving waters flowing within or immediately adjacent to the site;

e. Check for signs of sediment deposition that are visible from your site and attributable to your discharge (e.g., sand bars with no vegetation growing on top in receiving waters or in other constructed or natural site drainage features, or the buildup of sediment deposits on nearby streets, curbs, or open conveyance channels).

f. Identify any incidents of noncompliance observed.

4.6.2 If a discharge is occurring during your inspection:

a. Identify all discharge points at the site; and

b. Observe and document the visual quality of the discharge, and take note of the characteristics of the stormwater discharge, including color; odor; floating, settled, or suspended solids; foam; oil sheen; and other indicators of stormwater pollutants. Check also for signs of these same pollutant characteristics that are visible from your site and attributable to your discharge in receiving waters or in other constructed or natural site drainage features.

4.6.3 For dewatering inspections conducted pursuant to Parts 4.3.2, record the following in a report within 24 hours of completing the inspection:

a. The inspection date;

b. Names and titles of personnel making the inspection;

c. Approximate times that the dewatering discharge began and ended on the day of inspection;[75]

[75] If the dewatering discharge is a continuous discharge that continues after normal business hours,

d. Estimates of the rate (in gallons per day) of discharge on the day of inspection;

e. Whether or not any of the following indications of pollutant discharge were observed at the point of discharge to any receiving waters flowing through or immediately adjacent to the site and/or to constructed or natural site drainage features or storm drain inlets:[76]

i. a sediment plume, suspended solids, unusual color, presence of odor, decreased clarity, or presence of foam; and/or

ii. a visible sheen on the water surface or visible oily deposits on the bottom or shoreline of the receiving water; and

f. Photographs of (1) the dewatering water prior to treatment by a dewatering control(s) and the final discharge after treatment; (2) the dewatering control(s); and (3) the point of discharge to any receiving waters flowing through or immediately adjacent to the site and/or to constructed or natural site drainage features, storm drain inlets, and other conveyances to receiving waters.

You must also comply with the Part 4.7.2, 4.7.3, and 4.7.4 requirements for signing the reports, keeping them available on site, and retaining copies.

4.6.4 Based on the results of your inspection:

a. Complete any necessary maintenance repairs or replacements under Part 2.1.4 or under Part 5, whichever applies; and

b. Modify your SWPPP site map in accordance with Part 7.4.1 to reflect changes to your stormwater controls that are no longer accurately reflected on the current site map.

4.7 INSPECTION REPORT

4.7.1 You must complete an inspection report within 24 hours of completing any site inspection. Each inspection report (except for dewatering inspection reports, which are covered in Part 4.6.3) must include the following:

a. The inspection date;

b. Names and titles of personnel making the inspection;

c. A summary of your inspection findings, covering at a minimum the observations you made in accordance with Part 4.6, including any problems found during your inspection that make it necessary to perform routine maintenance pursuant to Part 2.1.4b or corrective action pursuant to Part 5. Include also any documentation as to why the corrective action procedures under Part 5 are unnecessary to fix a problem that repeatedly occurs as described in Part 2.1.4c;

d. If you are inspecting your site at the frequency specified in Part 4.2.2, Part 4.3, or Part 4.4.1b, and you conducted an inspection because of a storm event that produced rainfall measuring 0.25 inches or more within a 24-hour period, you must include the applicable rain gauge or weather station readings that triggered the inspection. Similarly, if you conducted an inspection because of a snowmelt discharge from a

indicate that the discharge is continuous.

[76] If the operator observes any of these indicators of pollutant discharge, corrective action is required consistent with Parts 5.1.5b and 5.2.2.

storm event that produced 3.25 inches or more of snow within a 24-hour period, you must include any measurements taken of snowfall at your site, or weather station information you relied on; and

e. If you determined that it is unsafe to inspect a portion of your site, you must describe the reason you found it to be unsafe and specify the locations to which this condition applies.

4.7.2 Each inspection report must be signed by the operator's signatory in accordance with Appendix G, Part G.11 of this permit.

4.7.3 You must keep a copy of all inspection reports at the site or at an easily accessible location, so that it can be made immediately available at the time of an on-site inspection or upon request by EPA.[77]

4.7.4 You must retain all inspection reports completed for this Part for at least three (3) years from the date that your permit coverage expires or is terminated.

4.8 INSPECTIONS BY EPA

You must allow EPA, or an authorized representative of EPA, to conduct the following activities at reasonable times. To the extent that you are utilizing shared controls, that are not on site, to comply with this permit, you must make arrangements for EPA to have access at all reasonable times to those areas where the shared controls are located.

4.8.1 Enter onto all areas of the site, including any construction support activity areas covered by this permit, any off-site areas where shared controls are utilized to comply with this permit, discharge locations, adjoining waterbodies, and locations where records are kept under the conditions of this permit;

4.8.2 Access and copy any records that must be kept under the conditions of this permit;

4.8.3 Inspect your construction site, including any construction support activity areas covered by this permit (see Part 1.2.1c), any stormwater controls installed and maintained at the site, and any off-site shared controls utilized to comply with this permit; and

4.8.4 Sample or monitor for the purpose of ensuring compliance.

5 CORRECTIVE ACTIONS

5.1 CONDITIONS TRIGGERING CORRECTIVE ACTION.

You must take corrective action to address any of the following conditions identified at your site:

5.1.1 A stormwater control needs a significant repair or a new or replacement control is needed, or, in accordance with Part 2.1.4c, you find it necessary to repeatedly (i.e., three (3) or more times) conduct the same routine maintenance fix to the same control at the same location (unless you document in your inspection report under Part 4.7.1c that the specific reoccurrence of this same problem should still be addressed as a routine

[77] Inspection reports may be prepared, signed, and kept electronically, rather than in paper form, if the records are: (a) in a format that can be read in a similar manner as a paper record; (b) legally dependable with no less evidentiary value than their paper equivalent; and (c) immediately accessible to the inspector during an inspection to the same extent as a paper copy stored at the site would be, if the records were stored in paper form. For additional guidance on the proper practices to follow for the electronic retention of inspection report records, refer to the Fact Sheet discussion related to Part 4.7.3.

maintenance fix under Part 2.1.4); or

5.1.2 A stormwater control necessary to comply with the requirements of this permit was never installed, or was installed incorrectly; or

5.1.3 Your discharges are not meeting applicable water quality standards;

5.1.4 A prohibited discharge has occurred (see Part 1.3); or

5.1.5 During discharge from site dewatering activities:

a. The weekly average of your turbidity monitoring results exceeds the 50 NTU benchmark (or alternate benchmark if approved by EPA pursuant to Part 3.3.2b); or

b. You observe or you are informed by EPA, State, or local authorities of the presence of the conditions specified in Part 4.6.3e.

5.2 CORRECTIVE ACTION DEADLINES

5.2.1 If responding to any of the Part 5.1.1, 5.1.2, 5.1.3, or 5.1.4 triggering conditions, you must:

a. Immediately take all reasonable steps to address the condition, including cleaning up any contaminated surfaces so the material will not discharge in subsequent storm events; and

b. When the problem does not require a new or replacement control or significant repair, the corrective action must be completed by the close of the next business day; or

c. When the problem requires a new or replacement control or significant repair, install the new or modified control and make it operational, or complete the repair, by no later than seven (7) calendar days from the time of discovery. If it is infeasible to complete the installation or repair within seven (7) calendar days, you must document in your records why it is infeasible to complete the installation or repair within the 7-day timeframe and document your schedule for installing the stormwater control(s) and making it operational as soon as feasible after the 7-day timeframe. Where these actions result in changes to any of the stormwater controls or procedures documented in your SWPPP, you must modify your SWPPP accordingly within seven (7) calendar days of completing this work.

5.2.2 If responding to either of the Part 5.1.5 triggering conditions related to site dewatering activities, you must:

a. Immediately take all reasonable steps to minimize or prevent the discharge of pollutants until you can implement a solution, including shutting off the dewatering discharge as soon as possible depending on the severity of the condition[78] taking safety considerations into account;

b. Determine whether the dewatering controls are operating effectively and whether they are causing the conditions; and

[78] For instance, if the weekly average of your turbidity monitoring results or a single sample is extremely high (e.g., a single turbidity sample results in 355 NTUs or higher), you should take action to safely shut off the discharge so that you can evaluate the cause of the high turbidity. Note: A single turbidity sample of 355 NTUs or higher means that the weekly average turbidity value will exceed 50 NTU regardless of the turbidity values the other days during the week.

c. Make any necessary adjustments, repairs, or replacements to the dewatering controls to lower the turbidity levels below the benchmark or remove the visible plume or sheen.

When you have completed these steps and made any changes deemed necessary, you may resume discharging from your dewatering activities.

5.3 CORRECTIVE ACTION REQUIRED BY EPA

You must comply with any corrective actions required by EPA as a result of permit violations found during an inspection carried out under Part 4.8.

5.4 CORRECTIVE ACTION LOG

5.4.1 For each corrective action taken in accordance with this Part, you must record the following in a corrective action log:

a. Within 24 hours of identifying the corrective action condition, document the specific condition and the date and time it was identified.

b. Within 24 hours of completing the corrective action (in accordance with the deadlines in Part 5.2), document the actions taken to address the condition, including whether any SWPPP modifications are required.

5.4.2 Each entry into the corrective action log, consisting of the information required by both Parts 5.4.1a and 5.4.1b, must be signed by the operator's signatory in accordance with Appendix G, Part G.11.2 of this permit.

5.4.3 You must keep a copy of the corrective action log at the site or at an easily accessible location, so that it can be made immediately available at the time of an on-site inspection or upon request by EPA.[79]

5.4.4 You must retain the corrective action log for at least three (3) years from the date that your permit coverage expires or is terminated.

6 STORMWATER TEAM FORMATION/STAFF TRAINING REQUIREMENTS

6.1 STORMWATER TEAM

Each operator, or group of multiple operators, must assemble a "stormwater team" that will be responsible for carrying out activities necessary to comply with this permit. The stormwater team must include the following people:

a. Personnel who are responsible for the design, installation, maintenance, and/or repair of stormwater controls (including pollution prevention controls);

b. Personnel responsible for the application and storage of treatment chemicals (if applicable);

c. Personnel who are responsible for conducting inspections as required in Part 4.1; and

[79] The corrective action log may be prepared, signed, and kept electronically, rather than in paper form, if the records are: (a) in a format that can be read in a similar manner as a paper record; (b) legally dependable with no less evidentiary value than their paper equivalent; and (c) immediately accessible to the inspector during an inspection to the same extent as a paper copy stored at the site would be, if the records were stored in paper form. For additional guidance on the proper practices to follow for the electronic retention of corrective action log records, refer to the Fact Sheet discussion related to Part 4.7.3.

d. Personnel who are responsible for taking corrective actions as required in Part 5.

Members of the stormwater team must be identified in the SWPPP pursuant to Part 7.2.2.

6.2 GENERAL TRAINING REQUIREMENTS FOR STORMWATER TEAM MEMBERS

Prior to the commencement of construction activities, you must ensure that all persons[80] assigned to the stormwater team understand the requirements of this permit and their specific responsibilities with respect to those requirements, including the following related to the scope of their job duties:

a. The permit requirements and deadlines associated with installation, maintenance, and removal of stormwater controls, as well as site stabilization**;**

b. The location of all stormwater controls on the site required by this permit and how they are to be maintained;

c. The proper procedures to follow with respect to the permit's pollution prevention requirements; and

d. When and how to conduct inspections, record applicable findings, and take corrective actions. Specific training requirements for persons conducting site inspections are included in Part 6.3.

You are responsible for ensuring that all activities on the site comply with the requirements of this permit. You are not required to provide or document formal training for subcontractors or other outside service providers (unless the subcontractors or outside service providers are responsible for conducting the inspections required in Part 4, in which case you must provide such documentation consistent with Part 7.2.2), but you must ensure that such personnel understand any requirements of this permit that may be affected by the work they are subcontracted to perform.

6.3 TRAINING REQUIREMENTS FOR PERSONS CONDUCTING INSPECTIONS

For projects that receive coverage under this permit on or after February 17, 2023, to be considered a qualified person under Part 4.1 for conducting inspections under Part 4, you must, at a minimum, either:

a. Have completed the EPA construction inspection course developed for this permit and have passed the exam; or

b. Hold a current valid construction inspection certification or license from a program that, at a minimum, covers the following:[81]

i. Principles and practices of erosion and sediment control and pollution prevention practices at construction sites;

ii. Proper installation and maintenance of erosion and sediment controls and pollution prevention practices used at construction sites; and

[80] If the person requiring training is a new employee who starts after you commence construction activities, you must ensure that this person has the proper understanding as required above prior to assuming particular responsibilities related to compliance with this permit. For emergency-related projects, the requirement to train personnel prior to commencement of construction activities does not apply, however, such personnel must have the required training prior to NOI submission.

[81] If one of the following topics (e.g., installation and maintenance of pollution prevention practices) is not covered by the non-EPA training program, you may consider supplementing the training with the analogous module of the EPA course (e.g., Module 4) that covers the missing topic.

iii. Performance of inspections, including the proper completion of required reports and documentation, consistent with the requirements of Part 4.

For projects that receive coverage under this permit prior to February 17, 2023, any personnel conducting site inspections pursuant to Part 4 on your site must, at a minimum, be a person knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention, who possesses the appropriate skills and training to assess conditions at the construction site that could impact stormwater quality, and the appropriate skills and training to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of this permit.[82]

6.4 STORMWATER TEAM'S ACCESS TO PERMIT DOCUMENTS

Each member of the stormwater team must have easy access to an electronic or paper copy of applicable portions of this permit, the most updated copy of your SWPPP, and other relevant documents or information that must be kept with the SWPPP.

7 STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

7.1 GENERAL REQUIREMENTS

All operators associated with a construction site under this permit must develop a SWPPP consistent with the requirements in Part 7 prior to their submittal of the NOI.[83, 84, 85] The SWPPP must be kept up-to-date throughout coverage under this permit.

If a SWPPP was prepared under a previous version of this permit, the operator must review and update the SWPPP to ensure that this permit's requirements are addressed prior to submitting an NOI for coverage under this permit.

[82] If you receive coverage for a project prior to February 17, 2023, and construction activities for the same project will continue after February 17, 2023, the personnel conducting inspections do not need to take the additional training specified in Parts 6.3a and 6.3b for inspections conducted on the project site. If the same operator obtains coverage for a different project on or after February 17, 2023, personnel conducting inspections would be required to meet the requirements for a qualified person by completing the training in either Part 6.3a or Part 6.3b.

[83] The SWPPP does not establish the effluent limits and/or other permit terms and conditions that apply to your site's discharges; these limits, terms, and conditions are established in this permit.

[84] Where there are multiple operators associated with the same site, they may develop a group SWPPP instead of multiple individual SWPPPs. Regardless of whether there is a group SWPPP or multiple individual SWPPPs, each operator is responsible for compliance with the permit's terms and conditions. In other words, if Operator A relies on Operator B to satisfy its permit obligations, Operator A does not have to duplicate those permit-related functions if Operator B is implementing them such that both operators are in compliance with the permit. However, Operator A remains responsible for permit compliance if Operator B fails to take actions necessary for Operator A to comply with the permit. In addition, all operators must ensure, either directly or through coordination with other operators, that their activities do not cause a violation or compromise any other operators' controls and/or any shared controls. See also footnote 61.

[85] There are a number of commercially available products to assist operators in developing the SWPPP, as well as companies that can be hired to help develop a site-specific SWPPP. The permit does not state which are recommended, nor does EPA endorse any specific products or vendors. Where operators choose to rely on these products or services, the choice of which ones to use to comply with the requirements of this Part is a decision for the operator alone.

7.2 SWPPP CONTENTS

At a minimum, the SWPPP must include the information specified in this Part and as specified in other parts of this permit.

7.2.1 All Site Operators. Include a list of all other operators who will be engaged in construction activities at the site, and the areas of the site over which each operator has control.

7.2.2 Stormwater Team. Identify the personnel (by name and position) that you have made part of the stormwater team pursuant to Part 6.1, as well as their individual responsibilities, including which members are responsible for conducting inspections.

Include verification that each member of the stormwater team has received the training required by Part 6.2. Include documentation that members of the stormwater team responsible for conducting inspections pursuant to Part 4 have received the training required by Part 6.3. If personnel on your team elect to complete the EPA inspector training program pursuant to Part 6.3a, you must include copies of the certificate showing that the relevant personnel have completed the training and passed the exam. If personnel on your team elect to complete a non-EPA inspector training program pursuant to Part 6.3b, you must include documentation showing that these persons have successfully completed the program and their certification or license is still current. You must also confirm that the non-EPA inspector training program satisfies the minimum elements for such programs in Part 6.3b.

7.2.3 Nature of Construction Activities. Include the following:

- **a.** A description of the nature of your construction activities, including the age or dates of past renovations for structures that are undergoing demolition;
- **b.** The size of the property (in acres or length in miles if a linear construction site);
- **c.** The total area expected to be disturbed by the construction activities (to the nearest quarter acre or nearest quarter mile if a linear construction site);
- **d.** A description of any on-site and off-site construction support activity areas covered by this permit (see Part 1.2.1c);
- **e.** The maximum area expected to be disturbed at any one time, including on-site and off-site construction support activity areas;
- **f.** A description and projected schedule for the following:[86]
  - **i.** Commencement of construction activities in each portion of the site, including clearing and grubbing, mass grading, demolition activities, site preparation (i.e., excavating, cutting and filling), final grading, and creation of soil and vegetation stockpiles requiring stabilization;
  - **ii.** Temporary or permanent cessation of construction activities in each portion of the site;
  - **iii.** Temporary or final stabilization of exposed areas for each portion of the site; and
  - **iv.** Removal of temporary stormwater controls and construction equipment or vehicles, and the cessation of construction-related pollutant-generating activities.

[86] If plans change due to unforeseen circumstances or for other reasons, the requirement to describe the sequence and estimated dates of construction activities is not meant to "lock in" the operator to meeting these dates. When departures from initial projections are necessary, this should be documented in the SWPPP itself, or in associated records, as appropriate.

g. A list and description of all pollutant-generating activities[87] on the site. For each pollutant-generating activity, include an inventory of pollutants or pollutant constituents (e.g., *sediment, fertilizers, pesticides, paints, caulks, sealants, fluorescent light ballasts, contaminated substrates, solvents, fuels*) associated with that activity, which could be discharged in stormwater from your construction site. You must take into account where potential spills and leaks could occur that contribute pollutants to stormwater discharges, and any known hazardous or toxic substances, such as PCBs and asbestos, that will be disturbed or removed during construction;

h. Business days and hours for the project;

i. If you are conducting construction activities in response to a public emergency (see Part 1.4), a description of the cause of the public emergency *(*e.g., *mud slides, earthquake, extreme flooding conditions, widespread disruption in essential public services)*, information substantiating its occurrence *(*e.g., *State disaster declaration or similar State or local declaration)*, and a description of the construction necessary to reestablish affected public services.

7.2.4 Site Map. Include a legible map, or series of maps, showing the following features of the site:

a. Boundaries of the property;

b. Locations where construction activities will occur, including:

i. Locations where earth-disturbing activities will occur (note any phasing), including any demolition activities;

ii. Approximate slopes before and after major grading activities (note any steep slopes (as defined in Appendix A));

iii. Locations where sediment, soil, or other construction materials will be stockpiled;

iv. Any receiving water crossings;

v. Designated points where vehicles will exit onto paved roads;

vi. Locations of structures and other impervious surfaces upon completion of construction; and

vii. Locations of on-site and off-site construction support activity areas covered by this permit (see Part 1.2.1c).

c. Locations of any receiving waters within the site and all receiving waters within one mile downstream of the site's discharge point(s). Also identify if any of these receiving waters are listed as impaired or are identified as a Tier 2, Tier 2.5, or Tier 3 water;

d. Any areas of Federally listed critical habitat within the action area of the site as defined in Appendix A;

e. Type and extent of pre-construction cover on the site (e.g., vegetative cover, forest, pasture, pavement, structures);

f. Drainage patterns of stormwater and authorized non-stormwater before and after major grading activities;

[87] Examples of pollutant-generating activities include paving operations; concrete, paint, and stucco washout and waste disposal; solid waste storage and disposal; and dewatering activities.

g. Stormwater and authorized non-stormwater discharge locations, including:

i. Locations where stormwater and/or authorized non-stormwater will be discharged to storm drain inlets, including a notation of whether the inlet conveys stormwater to a sediment basin, sediment trap, or similarly effective control;[88]

ii. Locations where stormwater or authorized non-stormwater will be discharged directly to receiving waters (i.e., not via a storm drain inlet); and

iii. Locations where turbidity benchmark monitoring will take place to comply with Part 3.3, if applicable to your site.

h. Locations of all potential pollutant-generating activities identified in Part 7.2.3g;

i. Designated areas where construction wastes that are covered by the exception in Part 2.3.3e.ii because they are not pollutant-generating will be stored;

j. Locations of stormwater controls, including natural buffer areas and any shared controls utilized to comply with this permit; and

k. Locations where polymers, flocculants, or other treatment chemicals will be used and stored.

7.2.5 Non-Stormwater Discharges. Identify all authorized non-stormwater discharges in Part 1.2.2 that will or may occur.

7.2.6 Description of Stormwater Controls.

a. For each of the Part 2.2 erosion and sediment control requirements, Part 2.3 pollution prevention requirements, and Part 2.4 construction dewatering requirements, as applicable to your site, you must include the following:

i. A description of the specific control(s) to be implemented to meet these requirements;

ii. The design specifications for controls described in Part 7.2.6a.i (including references to any manufacturer specifications and/or erosion and sediment control manuals/ordinances relied upon);[89]

iii. Routine stormwater control maintenance specifications; and

iv. The projected schedule for stormwater control installation/implementation.

b. You must also include any of the following additional information as applicable.

i. Natural buffers and/or equivalent sediment controls (see Part 2.2.1 and Appendix F). You must include the following:

(a) The compliance alternative to be implemented;

(b) If complying with alternative 2, the width of natural buffer retained;

[88] The requirement to show storm drain inlets in the immediate vicinity of the site on your site map only applies to those inlets that are easily identifiable from your site or from a publicly accessible area immediately adjacent to your site.

[89] Design specifications may be found in manufacturer specifications and/or in applicable erosion and sediment control manuals or ordinances. Any departures from such specifications must reflect good engineering practice and must be explained in the SWPPP.

(c) If complying with alternative 2 or 3, the erosion and sediment control(s) you will use to achieve an equivalent sediment reduction, and any information you relied upon to demonstrate the equivalency;

(d) If complying with alternative 3, a description of why it is infeasible for you to provide and maintain an undisturbed natural buffer of any size;

(e) For "linear construction sites" where it is infeasible to implement compliance alternative 1, 2, or 3, a rationale for this determination, and a description of any buffer width retained and/or supplemental erosion and sediment controls installed; and

(f) A description of any disturbances that are exempt under Part 2.2.1 that occur within 50 feet of a receiving water.

ii. Perimeter controls for a "linear construction site" (see Part 2.2.3d). For areas where perimeter controls are not feasible, include documentation to support this determination and a description of the other practices that will be implemented to minimize discharges of pollutants in stormwater associated with construction activities.

Note: Routine maintenance specifications for perimeter controls documented in the SWPPP must include the Part 2.2.3c.i requirement that sediment be removed before it has accumulated to one-half of the above-ground height of any perimeter control.

iii. Sediment track-out controls (see Parts 2.2.4b and 2.2.4c). Document the specific stabilization techniques and/or controls that will be implemented to remove sediment prior to vehicle exit.

iv. Inlet protection measures (see Part 2.2.10a). Where inlet protection measures are not required because the storm drain inlets to which your site discharges are conveyed to a sediment basin, sediment trap, or similarly effective control, include a short description of the control that receives the stormwater flow from the site.

v. Sediment basins (see Part 2.2.12). In circumstances where it is infeasible to utilize outlet structures that withdraw water from the surface, include documentation to support this determination, including the specific conditions or time periods when this exception will apply.

vi. Treatment chemicals (see Part 2.2.13), you must include the following:

(a) A listing of the soil types that are expected to be exposed during construction in areas of the project that will drain to chemical treatment systems. Also include a listing of soil types expected to be found in fill material to be used in these same areas, to the extent you have this information prior to construction;

(b) A listing of all treatment chemicals to be used at the site and why the selection of these chemicals is suited to the soil characteristics of your site;

(c) If the applicable EPA Regional Office authorized you to use cationic treatment chemicals for sediment control, include the specific controls and implementation procedures designed to ensure that your use of cationic

treatment chemicals will not lead to a discharge that does not meet water quality standards;

(d) The dosage of all treatment chemicals to be used at the site or the methodology to be used to determine dosage;

(e) Information from any applicable Safety Data Sheet (SDS);

(f) Schematic drawings of any chemically enhanced stormwater controls or chemical treatment systems to be used for application of the treatment chemicals;

(g) A description of how chemicals will be stored consistent with Part 2.2.13c;

(h) References to applicable State or local requirements affecting the use of treatment chemicals, and copies of applicable manufacturer's specifications regarding the use of your specific treatment chemicals and/or chemical treatment systems; and

(i) A description of the training that personnel who handle and apply chemicals have received prior to permit coverage, or will receive prior to use of the treatment chemicals at your site.

vii. Stabilization measures (see Part 2.2.14). You must include the following:

(a) The specific vegetative and/or non-vegetative practices that will be used;

(b) The stabilization deadline that will be met in accordance with Part 2.2.14;

(c) If complying with the deadlines for sites in arid, semi-arid, or drought-stricken areas, the beginning and ending dates of the seasonally dry period (as defined in Appendix A)[90] and the schedule you will follow for initiating and completing vegetative stabilization; and

(d) If complying with deadlines for sites affected by unforeseen circumstances that delay the initiation and/or completion of vegetative stabilization, document the circumstances and the schedule for initiating and completing stabilization.

viii. Spill prevention and response procedures (see Parts 1.3.5, 2.3.3c, 2.3.3d, and 2.3.6). You must include the following:

(a) Procedures for expeditiously stopping, containing, and cleaning up spills, leaks, and other releases. Identify the name or position of the employee(s) responsible for detection and response of spills or leaks; and

(b) Procedures for notification of appropriate facility personnel, emergency response agencies, and regulatory agencies where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity consistent with Part 2.3.6 and established under either 40 CFR part 110, 40 CFR part 117, or 40 CFR part 302, occurs

[90] See footnote 45.

during a 24-hour period. Contact information must be in locations that are readily accessible and available to all employees.

You may also reference the existence of SPCC plans developed for the construction activity under Section 311 of the CWA, or spill control programs otherwise required by an NPDES permit for the construction activity, provided that you keep a copy of that other plan on site.[91]

ix. Waste management procedures (see Part 2.3.3). Describe the procedures you will follow for handling, storing, and disposing of all wastes generated at your site consistent with all applicable Federal, State, Tribal, and local requirements, including clearing and demolition debris, sediment removed from the site, construction and domestic waste, hazardous or toxic waste, and sanitary waste. You must also include the following additional information:

(a) If site constraints prevent you from storing chemical containers 50 feet away from receiving waters or the other site drainage features as required in Part 2.3.3c.ii(b), document in your SWPPP the specific reasons why the 50-foot setback is not feasible, and how you will store containers as far away as the site permits; and

(b) If there are construction wastes that are subject to the exception in Part 2.3.3e.ii, describe the specific wastes that will be stored on your site.

x. Application of fertilizers (see Part 2.3.5). Document any departures from the manufacturer specifications where appropriate.

7.2.7 Procedures for Inspection, Maintenance, and Corrective Action. Describe the procedures you will follow for maintaining your stormwater controls, conducting site inspections, and, where necessary, taking corrective actions, in accordance with Part 2.1.4, Part 4, and Part 5 of this permit, accordingly. Also include:

a. The inspection schedule you will follow, which is based on whether your site is subject to Part 4.2 or Part 4.3, or whether your site qualifies for any of the reduced inspection frequencies in Part 4.4;

b. If you will be conducting inspections in accordance with the inspection schedule in Part 4.2.2, Part 4.3, or Part 4.4.1b, the location of the rain gauge or the address of the weather station you will be using to obtain rainfall data;

c. If you will be reducing your inspection frequency in accordance with Part 4.4.1b, the beginning and ending dates of the seasonally defined arid period for your area or the valid period of drought;

d. If you will be reducing your inspection frequency in accordance with Part 4.4.3, the beginning and ending dates of frozen conditions on your site; and

e. Any maintenance or inspection checklists or other forms that will be used.

7.2.8 Procedures for Turbidity Benchmark Monitoring from Dewatering Discharges (if applicable). If you are required to comply with the Part 3.3 turbidity benchmark

[91] Even if you already have an SPCC or other spill prevention plan in existence, your plans will only be considered adequate if they meet all of the requirements of this Part, either as part of your existing plan or supplemented as part of the SWPPP.

monitoring requirements, describe the procedures you will follow to collect and evaluate samples, report results to EPA and keep records of monitoring information, and take corrective action when necessary. Include the specific type of turbidity meter you will use for monitoring, as well as any manuals or manufacturer instructions on how to operate and calibrate the meter. Describe any coordinating arrangement you may have with any other permitted operators on the same site with respect to compliance with the turbidity monitoring requirements, including which parties are tasked with specific responsibilities. If EPA has approved of an alternate turbidity benchmark pursuant to Part 3.3.2b, include any data and other documentation you relied on to request use of the specific alternative benchmark.

7.2.9 Compliance with Other Requirements.

a. Threatened and Endangered Species Protection. Include documentation required in the Endangered Species Protection section of the NOI in NeT, or the ESA worksheet in Appendix D, supporting your eligibility with regard to the protection of threatened and endangered species and designated critical habitat.

b. Historic Properties. Include documentation required in Appendix E supporting your eligibility with regard to the protection of historic properties.

c. Safe Drinking Water Act Underground Injection Control (UIC) Requirements for Certain Subsurface Stormwater Controls. If you are using any of the following stormwater controls at your site, document any contact you have had with the applicable State agency[92] or EPA Regional Office responsible for implementing the requirements for underground injection wells in the Safe Drinking Water Act and EPA's implementing regulations at 40 CFR § 144 -147. Such controls would generally be considered Class V UIC wells:

i. Infiltration trenches (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system);

ii. Commercially manufactured pre-cast or pre-built proprietary subsurface detention vaults, chambers, or other devices designed to capture and infiltrate stormwater flow; and

iii. Drywells, seepage pits, or improved sinkholes (if stormwater is directed to any bored, drilled, driven shaft or dug hole that is deeper than its widest surface dimension, or has a subsurface fluid distribution system).

7.2.10 SWPPP Certification. Your signatory must sign and date your SWPPP in accordance with Appendix G, Part G.11.

7.2.11 Post-Authorization Additions to the SWPPP. Once you are authorized for coverage under this permit, you must include the following documents as part of your SWPPP:

a. A copy of your NOI submitted to EPA along with any correspondence exchanged between you and EPA related to coverage under this permit;

b. A copy of the acknowledgment letter you receive from NeT assigning your NPDES ID (i.e.*, permit tracking number*);

[92] For State UIC program contacts, refer to the following EPA website: https://www.epa.gov/uic.

c. A copy of this permit (an electronic copy easily available to the stormwater team is also acceptable).

7.3 ON-SITE AVAILABILITY OF YOUR SWPPP

You must keep a current copy of your SWPPP at the site or at an easily accessible location so that it can be made available at the time of an on-site inspection or upon request by EPA; a State, Tribal, or local agency approving stormwater management plans; the operator of a storm sewer system receiving discharges from the site; or representatives of the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Service (NMFS).[93]

EPA may provide access to portions of your SWPPP to a member of the public upon request. Confidential Business Information (CBI) will be withheld from the public, but may not be withheld from EPA, USFWS, or NMFS.[94]

If an on-site location is unavailable to keep the SWPPP when no personnel are present, notice of the plan's location must be posted near the main entrance of your construction site.

7.4 SWPPP MODIFICATIONS

7.4.1 You must modify your SWPPP, including the site map(s), within seven (7) days of any of the following conditions:

a. Whenever new operators become active in construction activities on your site, or you make changes to your construction plans, stormwater controls, or other activities at your site that are no longer accurately reflected in your SWPPP. This includes changes made in response to corrective actions triggered under Part 5. You do not need to modify your SWPPP if the estimated dates in Part 7.2.3f change during the course of construction;

b. To reflect areas on your site map where operational control has been transferred (and the date of transfer) since initiating permit coverage;

c. If inspections or investigations by EPA or its authorized representatives determine that SWPPP modifications are necessary for compliance with this permit;

d. Where EPA determines it is necessary to install and/or implement additional controls at your site in order to meet the requirements of this permit, the following must be included in your SWPPP:

i. A copy of any correspondence describing such measures and requirements; and

[93] The SWPPP may be prepared, signed, and kept electronically, rather than in paper form, if the records are: (a) in a format that can be read in a similar manner as a paper record; (b) legally dependable with no less evidentiary value than their paper equivalent; and (c) immediately accessible to the inspector during an inspection to the same extent as a paper copy stored at the site would be, if the records were stored in paper form. For additional guidance on the proper practices to follow for the electronic retention of the SWPPP, refer to the Fact Sheet discussion related to Part 4.7.3.

[94] Information covered by a claim of confidentiality will be disclosed by EPA only to the extent of, and by means of, the procedures set forth in 40 CFR part 2, Subpart B. In general, submitted information protected by a business confidentiality claim may be disclosed to other employees, officers, or authorized representatives of the United States concerned with implementing the CWA. The authorized representatives, including employees of other executive branch agencies, may review CBI during the course of reviewing draft regulations.

ii. A description of the controls that will be used to meet such requirements.

e. To reflect any revisions to applicable Federal, State, Tribal, or local requirements that affect the stormwater controls implemented at the site; and

f. If applicable, if a change in chemical treatment systems or chemically enhanced stormwater control is made, including use of a different treatment chemical, different dosage rate, or different area of application.

7.4.2 You must maintain records showing the dates of all SWPPP modifications. The records must include the name of the person authorizing each change (see Part 7.2.9 above) and a brief summary of all changes.

7.4.3 All modifications made to the SWPPP consistent with Part 7.4 must be authorized by a person identified in Appendix G, Part G.11.b.

7.4.4 Upon determining that a modification to your SWPPP is required, if there are multiple operators covered under this permit, you must immediately notify any operators who may be impacted by the change to the SWPPP.

8 HOW TO TERMINATE COVERAGE

Until you terminate coverage under this permit, you must comply with all conditions and effluent limitations in the permit. To terminate permit coverage, you must submit to EPA a complete and accurate Notice of Termination (NOT), which certifies that you have met the requirements for terminating in Part 8.

8.1 MINIMUM INFORMATION REQUIRED IN NOT

8.1.1 NPDES ID (i.e*., permit tracking number)* provided by EPA when you received coverage under this permit;

8.1.2 Basis for submission of the NOT (see Part 8.2);

8.1.3 Operator contact information;

8.1.4 Name of site and address (or a description of location if no street address is available); and

8.1.5 NOT certification.

8.2 CONDITIONS FOR TERMINATING CGP COVERAGE

You may terminate CGP coverage only if one or more of the conditions in Parts 8.2.1, 8.2.2, or 8.2.3 has occurred. Until your termination is effective consistent with Part 8.5, you must continue to comply with the conditions of this permit.

8.2.1 You have completed all construction activities at your site and, if applicable, construction support activities covered by this permit (see Part 1.2.1c), and you have met all of the following requirements:

a. For any areas that (1) were disturbed during construction, (2) are not covered by permanent structures, and (3) over which you had control during the construction activities, you have met the requirements for final vegetative or non-vegetative stabilization in Part 2.2.14c.

To document that you have met these stabilization requirements, you must take either ground or aerial photographs that show your site's compliance with the Part 2.2.14 stabilization requirements and submit them with your NOT. If any portion of your

site is covered by one of the exceptions in Part 2.2.14c.iii, indicate which exception applies and include a supplementary explanation with your photographs that provides the necessary context for why this portion of the site is in compliance with the final stabilization criteria even though it appears to be unstabilized. You are not required to take photographs of every distinct part of your site that is being stabilized, however, the conditions of the site portrayed in any photographs that are submitted must be substantially similar[95] to those of the areas that are not photographed. You must also comply with the following related to these photographs:

i. Take photographs both before and after the site has met the final stabilization criteria in Part 2.2.14c;

ii. All photographs must be clear and in focus, and in the original format and resolution; and

iii. Include the date each photograph was taken, and a brief description of the area of the site captured by the photograph (e.g., photo shows application of seed and erosion control mats to remaining exposed surfaces on northeast corner of site).

b. You have removed and properly disposed of all construction materials, waste and waste handling devices, and have removed all equipment and vehicles that were used during construction, unless intended for long-term use following your termination of permit coverage;

c. You have removed all stormwater controls that were installed and maintained during construction, except those that are intended for long-term use following your termination of permit coverage or those that are biodegradable (as defined in Appendix A); and

d. You have removed all potential pollutants and pollutant-generating activities associated with construction, unless needed for long-term use following your termination of permit coverage; or

8.2.2 You have transferred control of all areas of the site for which you are responsible under this permit to another operator, and that operator has submitted an NOI and obtained coverage under this permit; or

8.2.3 Coverage under an individual or alternative general NPDES permit has been obtained.

8.3 HOW TO SUBMIT YOUR NOT

You must use EPA's NPDES eReporting Tool (NeT) to electronically prepare and submit an NOT for the 2022 CGP.

To access NeT, go to https://cdx.epa.gov/cdx.

Waivers from electronic reporting may be granted as specified in Part 1.4.2. If the EPA Regional Office grants you approval to use a paper NOT, and you elect to use it, you must complete the form in Appendix I.

[95] Stabilization conditions that are substantially similar would include areas that are using the same type of stabilization measures and that have similar slopes, soils, and topography, and have achieved the same level of stabilization.

8.4 DEADLINE FOR SUBMITTING THE NOT

You must submit an NOT within 30 calendar days after any one of the conditions in Part 8.2 occurs.

8.5 EFFECTIVE DATE OF TERMINATION OF COVERAGE

Your authorization to discharge under this permit terminates at midnight of the calendar day that a complete NOT is submitted to EPA.

9 PERMIT CONDITIONS APPLICABLE TO SPECIFIC STATES, INDIAN COUNTRY LANDS, OR TERRITORIES

The provisions in this Part provide additions to the applicable conditions of this permit to reflect specific additional conditions required as part of the State or Tribal CWA Section 401 certification process, or the Coastal Zone Management Act (CZMA) certification process, or as otherwise established by the permitting authority. The specific additional revisions and requirements only apply to activities in those specific States, Indian country, and areas in certain States with Federal Facilities or areas subject to construction projects by Federal Operators. States, Indian country, and other areas not included in this Part do not have any additions to the applicable conditions of this permit.

9.1 EPA REGION 1

9.1.1 NHR100000 State of New Hampshire

a. Should the permit coverage for an individual applicant be insufficient to achieve water quality standards, the New Hampshire Department of Environmental Services (NHDES) may prepare additional 401 certification conditions for that applicant. Any additional 401 certification conditions will follow all required NHDES public participation requirements.

b. If you disturb 100,000 square feet or more of contiguous area, you must also comply with RSA 485-A:17 and Env-Wq 1500, and, unless exempt, apply for an Alteration of Terrain (AoT) permit from NHDES. This requirement also applies to a lower disturbance threshold of 50,000 square feet or more when construction occurs within the protected shoreline under the Shoreland Water Quality Protection Act (see RSA 483-B and Env-Wq 1400). A permit application must also be filed if your project disturbs an area of greater than 2,500 square feet, is within 50 feet of any surface water, and has a flow path of 50 feet or longer disturbing a grade of 25 percent or greater. Project sites with disturbances smaller than those discussed above, that have the potential to adversely affect state surface waters, are subject to the conditions of an AoT General Permit by Rule (Env-Wq 1503.03).

c. You must determine that any excavation dewatering discharges are not contaminated before they will be authorized as an allowable non-stormwater discharge under this permit (see Part 1.2.2 of the Construction General Permit or CGP). In the absence of information demonstrating otherwise, the water is considered uncontaminated if there is no groundwater contamination within 1,000 feet of the groundwater dewatering location. Information on groundwater contamination can be generated over the Internet via the NHDES web site http:// des.nh.gov/ by using the One Stop Data Mapper. For a toxic substance included in the New Hampshire surface water quality standards, see Env-Wq 1703.21 (see https://www.des.nh.gov/sites/g/fi1es/ehbemt 341/files/documents/2020-01/Env-Wg

1700.pdf). If it is determined that the groundwater to be dewatered is near a remediation or other waste site, you must apply for the Remediation General Permit (see https://www3.epa.gov/region1/npdes/rgp.html)

d. As a minimum, you must treat any uncontaminated excavation "dewatering" discharges and "stormwater" discharges, as those terms are defined in Appendix A of the CGP, as necessary, to remove suspended solids and turbidity so that the surface waters receiving the construction discharges[96] meet New Hampshire surface water quality standards for turbidity (Env-Wq 1703.11 and Env-Wq 1703.03(c)(1)c), benthic deposits (Env-Wq 1703.03(c)(1)a), and Env-Wq 1703.08) and foam, debris, scum or other visible substances (i.e., plumes or visual turbidity)[97] (Env-Wq 1703.03(c)(1)b).

i. For all Construction Activities covered under this CGP, the following shall apply to ensure compliance with the aforementioned regulations for turbidity, benthic deposits and visible substances:

Unless otherwise specified, site inspection requirements shall comply with Part 4 of the CGP. As a minimum site inspection frequency shall be in accordance with Part 4.2.2 of the CGP (and Part 4.3.2 of the CGP for sites discharging dewatering water). Site inspection frequency may be reduced in accordance with Part 4.4 of the CGP (Reductions in Inspection Frequency). Monitoring of the receiving water for visible turbidity and benthic sediment deposits shall be conducted each site inspection and results reported in the Inspection Report required in Part 4.7 of the CGP. Should visible turbidity or benthic sediment deposits attributable or partly attributable to your construction activities be present in the receiving water, the "Corrective Actions" specified in Part 5 shall be immediately implemented to correct the water quality standard violations. In addition, daily monitoring (including photographs) of the receiving water shall be conducted until there is no visible turbidity or benthic deposits. Inspection Reports required in Part 4.7 of the CGP shall include, but not be limited to, the distance downstream and the percent of the river width[98] where visible turbidity was observed, and the period of time that the visible turbidity persisted. A copy of the Inspection Report(s) shall be made available to NHDES within 24 hours of receiving a written request from NHDES.

ii. For Construction Activities, disturbing 5 acres or more of land at any one time (excluding areas that have been completely stabilized in accordance with the final stabilization criteria specified in Part 2.2.14.c of the CGP), the following shall

[96] Construction Discharges include uncontaminated "dewatering" and "stormwater" discharges as those terms are defined in Appendix A of the CGP. Controlled construction discharges are construction discharges where the rate of flow can be regulated such as from a construction settling basin or NHDES approved flocculation system.

[97] For the definition of visual turbidity, see the definition for "Non-Turbid" in Appendix A of the CGP, which states the following:" "Non-Turbid" - a discharge that is free from visual turbidity. For the purposes of this permit, visual turbidity refers to a sediment plume or other cloudiness in the water caused by sediment that can be identified by an observer." *[EPA interprets the text of this footnote as intending to reference the Appendix A definitions of "visual turbidity" and "non-turbid" in the final permit.]*

[98] The distance downstream and the percent of river width where visible turbidity (i.e., plume) is observed is required to determine the extent of the river affected and to determine if there was a "zone of passage" (i.e., a portion of the receiving water where there was no visible turbidity where mobile organisms could pass without being adversely impacted). The percent of river width affected is equal 100 multiplied by the width of the plume (in feet) divided by the width of the receiving water (in feet).

apply to ensure compliance with the aforementioned regulations for turbidity, benthic deposits and visible substances.

Item 9.1.1.d.i) above shall apply to all construction discharges and the minimum site inspection frequency shall comply with Part 4.3.1 of the CGP (and Part 4.3.2 of the CGP for sites discharging dewatering water). Site inspection frequency may be reduced in accordance with Part 4.4 of the CGP (Reductions in Inspection Frequency).

With regards to controlled construction discharges, if there is no visible turbidity (i.e., plumes) or benthic deposits, and, in the absence of information demonstrating otherwise, turbidity measurements of less than or equal to 50 nephelometric turbidity units (NTU) in the controlled construction discharges at the outlet prior to mixing with the receiving surface waters, shall be presumed to meet New Hampshire surface water quality standards for the parameters listed above. As a minimum, the controlled construction discharges must be sampled at each site inspection.

If any controlled construction discharge exceeds 50 NTU, or if visible turbidity or benthic sediment deposits attributable or partly attributable to any construction discharge are observed in the receiving water, then the "Corrective Actions" specified in Part 5 of the CGP shall be immediately implemented.

In addition, should such violation occur, and, in order to determine compliance with surface water quality standards for turbidity (Env-Wq 1703.11 and Env-Wq 1703.03(c)(1)c), benthic deposits (Env-Wq 1703.03(c)(1)a), and Env-Wq 1703.08) and foam, debris, scum or other visible substances (Env-Wq 1703.03(c)(1)b)), turbidity monitoring shall be immediately implemented as specified below:

Turbidity samples of the receiving water shall be immediately taken in the receiving water upstream and beyond the influence of the construction activity, and, unless a mixing zone[99] is approved by NHDES, no more than 75 feet downstream of each controlled construction discharge that exceeded 50 NTU and no more than 75 feet downstream of each construction discharge that caused visible turbidity.

Downstream samples shall be taken at locations in the receiving water that are most likely influenced by the discharge (e.g., if visible turbidity (i.e., a plume) is present, the sample shall be taken in the plume). Samples shall be collected a minimum of 2 times per day during the daylight hours at times when construction activities are most likely to cause turbidity in the receiving water and shall continue until the turbidity water quality standards are met in the receiving water (i.e., the difference between the upstream and downstream turbidity level is no greater than 10 NTU).

[99] Permittees may request a distance greater than 75 feet downstream of a construction discharge for determining compliance with turbidity standards in Class B surface waters, by submitting a mixing zone request to NHDES that complies with Env-Wq 1707.02. If a mixing zone is approved, NHDES is required to include conditions to ensure that the criteria on which the approval is based are met (Env-Wq 1707.03).

If water quality standards are not met during daylight hours on any day, sampling shall resume the next day and continue no fewer than 2 times per day until water quality standards are met. The date, time, location and results of turbidity measurements, as well as a summary identifying the cause of the violations, corrective actions that were implemented, the period of time that the receiving water exceeded turbidity standards and the distance downstream and the percent of the river width where visible turbidity was observed, and the period of time that the visible turbidity persisted, shall be recorded and included in the Inspection Report required in Part 4.7 of the CGP. Turbidity measurements shall be conducted via a field meter in accordance with the requirements for turbidity specified in Table 1B in 40 CFR 136.3 (see 40 CFR §136.3 Identification of test procedures - Code of Federal Regulations ecfr.io). Field meters shall be calibrated every day sampling is conducted and prior to the first sample.

e. Construction site owners and operators are encouraged to consider opportunities for post- construction groundwater recharge using infiltration best management practices (BMPs) during site design and preparation of the SWPPP in order to assure compliance with Env-Wq 1703.03 and Env-Wq 1703.11. If your construction site is in a town that is required to obtain coverage under the NPDES General Permit for discharges from Municipal Separate Storm Sewer Systems (MS4) you may be required to use such practices. The SWPPP must include a description of any on-site infiltration that will be installed as a post-construction stormwater management measure or reasons for not employing such measures such as 1) The facility is located in a wellhead protection area as defined in RSA 485- C:2; or 2) The facility is located in an area where groundwater has been reclassified to GAA, GA1 or GA2 pursuant to RSA 485-C and Env-DW 901; or 3) Any areas that would be exempt from the groundwater recharge requirements contained in Env-Wq 1507.04, including all land uses or activities considered to be a "High-load Area" (see Env-Wq 1502.30). For design considerations for infiltration measures see Env-Wq 1508.06. Note that there may be additional local requirements that fall under the NH MS4 permittee's Authorization to Discharge Permit for those regulated areas.

f. Appendix F of the CGP contains information regarding Tier 2, or high quality waters in the various states. ***[EPA notes that this information has now been moved to https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates]*** Although there is no official list of tier 2 waters for New Hampshire, it can be assumed that all New Hampshire surface waters are tier 2 for turbidity unless 1) the surface water that you are proposing to discharge into is listed as impaired for turbidity in the states listing of impaired waters (see https://nhdes-surface-water-quality-assessment-site-nhdes.hub.arcgis.com/) or 2) sampling upstream of the proposed discharge location shows turbidity values greater than 10 NTU (Env-Wq 1703.11). A single grab sample collected during dry weather (no precipitation within 48 hours) is acceptable.

g. To ensure compliance with RSA 485-C, RSA 485-A, RSA 485-A:13, I(a), Env-Wq 1700 and Env-Wq 302, the following information may be requested by NHDES. This information must be kept on site unless you receive a written request from NHDES that it be sent to the address shown below in 9.1.1.h.

i. A list of all non-stormwater discharges that occur at the facility, including their source locations and the control measures being used (see Part 1.2.2 of the CGP).

ii. Records of sampling and analysis required for construction dewatering and stormwater discharges (see 9.1.1.d above).

h. All required or requested documents must be sent to: NH Department of Environmental Services, Watershed Management Bureau, P.O. Box 95 Concord, NH 03302-0095.

9.1.2 MAR100000 Commonwealth of Massachusetts (except Indian country)

a. All discharges covered by the Construction General Permit shall comply with the provisions pursuant to 314 CMR 3.00, 314 CMR 4.00, 314 CMR 9.00, including applicable construction stormwater standards and 310 CMR 10.00.

b. Pursuant to 314 CMR 3.11 (2)(a)6., and in accordance with MassDEP's obligation under 314 CMR 4.05(5)(e) to maintain surface waters free from pollutants in concentrations or combinations that are toxic to humans, aquatic life, or wildlife, permittees are prohibited from discharging dewatering water under the CGP from sites that are designated as Superfund/CERCLA or RCRA, and must make accommodations to dispose of the dewatering discharges appropriately, such as coverage under the Remediation General Permit (RGP).

c. Pursuant to 314 CMR 3.11 (2)(a), and in accordance with MassDEP's obligation to protect Outstanding Resource Waters under 314 CMR 4.04(3), applicants seeking coverage under the 2022 CGP that propose to carry out construction activities near Outstanding Resource Waters as identified in 314 CMR 4.06, shall submit to MassDEP for review:

i. a copy of the Stormwater Pollution Prevention Plan (SWPPP),

ii. a copy of the EPA NOI, and

iii. MassDEP's Stormwater BMP Checklist.

For purposes of this review, the permittee shall submit these documents to MassDEP at the same time they are submitted to EPA. Instructions on how to submit these documents to MassDEP and where to find the MassDEP Stormwater BMP Checklist and obtain authorization to discharge can be found here: https://www.mass.gov/how-to/wm-15-npdes-general-permit-notice-of- intent.

d. Pursuant to 314 CMR 3.11 (2)(a)6., and in accordance with MassDEP's obligation under 314 CMR 4.05(5)(e) to maintain surface waters free from pollutants in concentrations or combinations that are toxic to humans, aquatic life, or wildlife, applicants that propose to dewater under the 2022 CGP and plan to discharge to certain waters as described below, shall determine that any dewatering discharges are not contaminated by testing the proposed discharge as described below as part of the application for WM15 authorization. Unless otherwise specified, testing described in this section should be conducted using the methods in 40 CFR 136.

i. Applicants for sites that plan to discharge to Outstanding Resource Waters as identified in 314 CMR 4.06 shall test one sample of the proposed dewatering discharge water for pH, E. Coli (for discharges to freshwater), fecal coliform (for

discharges to salt water), Enterococci (for discharges to salt water), total suspended solids, oil and grease, total nitrogen, total phosphorus, and all parameters with numeric criteria listed in the Massachusetts Surface Water Quality Standards at 314 CMR 4.05(e). Results shall be reported to MassDEP as part of the WM15 application. To determine if the dewatering discharge could be covered under the 2022 CGP, the effluent at zero dilution must meet numeric water quality criteria. If the effluent does not meet numeric water quality criteria, the applicant shall contact EPA Region 1 to discuss coverage under the Remediation General Permit.

ii. Applicants for sites that propose to discharge to Public Water Supplies (314 CMR 4.06(1)(d)1) shall also test one sample of the proposed dewatering discharge water for per- and polyfluoroalkyl substances (PFAS), as outlined in the table below. Results shall be reported to MassDEP as part of the WM15 application. If any PFAS compounds are detected, the applicant shall apply for coverage under the NPDES Remediation General Permit for Massachusetts if required.

PFAS Testing Parameters for Discharges to Public Drinking Water Supplies[100]	
Perfluorohexanesulfonic acid (PFHxS), grab	Report ng/L
Perfluoroheptanoic acid (PFHpA), grab	Report ng/L
Perfluorononanoic acid (PFNA), grab	Report ng/L
Perfluorooctanesulfonic acid (PFOS), grab	Report ng/L
Perfluorooctanoic acid (PFOA), grab	Report ng/L
Perfluorodecanoic acid (PFDA), grab	Report ng/L

iii. Applicants for sites that propose to discharge to an impaired water as identified in the most recent final Massachusetts Integrated List of Waters,shall test one sample of the proposed dewatering discharge water for the parameter(s) for which the waterbody is impaired. To determine if the dewatering discharge could be covered under the 2022 CGP, the effluent at zero dilution must meet numeric water quality criteria. If the effluent does not meet numeric water quality criteria, the applicant shall contact EPA Region 1 to discuss coverage under the Remediation GeneralPermit and shall apply for RGP coverage if required.

iv. For dewatering discharges to all other waters, if any pollutants are knownor believed present in the proposed dewatering discharge water, the applicant shall apply for coverage under the NPDES Remediation General Permit for Massachusetts if required. For the purposes of this condition, a pollutant is "known present" if measured above the analytical detection limit using a sufficiently sensitive test method in an environmental sample, and "believed present" if a pollutant has not been measured in an environmental sample but will be added or generated prior to discharge, such as through a treatment process. Consequently, a pollutant is "known absent" if measured as non-detect relative to the analytical detection limit using a sufficiently sensitive test method in an environmental sample, and "believed absent" if a pollutant has not been measured in an environmentalsample but will not be added or generated prior to discharge and is not a parameter that applies to the applicable activity category for a site. If any pollutants are known or believed present in the

[100] PFAS testing shall follow established EPA methods 537 or 537.1 for drinking water until EPA Method 3512 for non-potable water becomes available.

proposed dewatering discharge water, the applicant shall test one sample of the proposed dewatering discharge water for the pollutants known or believed to be present. To determine if the dewatering discharge could be covered under the 2022 CGP, the effluent at zero dilution must meet numeric water quality criteria. If the effluent does not meet numeric water quality criteria, the applicant shall contact EPA Region 1 to discuss coverage under the Remediation General Permit.

e. Pursuant to 314 CMR 3.11 (2)(a), and in accordance with MassDEP's obligation to protect Outstanding Resource Waters under 314 CMR 4.04(3), applicants that propose to dewater under the 2022 CGP and discharge to Outstanding Resource Waters as identified in 314 CMR 4.06, shall submit the SWPPP and associated documents to MassDEP to review. MassDEP shall complete review within 30 daysof receipt.

f. Pursuant to 314 CMR 3.11 (2)(a)6., and in accordance with MassDEP's obligation under 314 CMR 4.05 to maintain surface waters free from color and turbidity in concentrations or combinations that are aesthetically objectionable or would impair any use assigned to the waterbody, permittees that have been authorized to dewater under the 2022 CGP and that discharge to Outstanding Resource Waters as identified in 314 CMR 4.06 shall carry out daily benchmark monitoring for turbidity[101] for the duration of dewatering. Permittees shall compare the weekly average of the turbidity monitoring results with the established benchmark turbidity value of 25 Nephelometric Turbidity Units (NTU). If a permittee's weekly average turbidity results exceed the benchmark, the operator shall conduct follow-up corrective action to determine the source of the problem and to make any necessary repairs or upgrades to the dewatering controls to lower the turbidity levels. The permittee shall document any corrective action taken in its corrective action log. Furthermore, permittees at these sites shall carry out inspections at higher frequency, specifically, daily inspections of the dewatering discharge treatment for the duration of the discharge. The permittee shall inspect the site for sediment plume or whether a hydrocarbon sheen is visible at the point of discharge, estimate the flow rate at the point of discharge, and inspect the site downstream to assess whether sedimentation is attributable to the dewatering discharges.

g. Pursuant to 314 CMR 3.11 (2)(a)6., and in accordance with MassDEP's obligation under 314 CMR 4.05 to maintain surface waters free from color and turbidity in concentrations or combinations that are aesthetically objectionable or would impair any use assigned to the waterbody, permittees shall store materials outside the Base Flood Elevation[102] when feasible to prevent displacing runoff and erosion.

h. Pursuant to 314 CMR 3.11 (2)(a), and in accordance with MassDEP's obligation to maintain surface waters free from nutrients in concentrations that would cause or contribute to impairment of existing or designated uses under 314 CMR 4.05(5)(c), all applicants who apply for coverage under the 2022 CGP shall follow guidelines on fertilizer application, including use of fertilizer containing no phosphorus, in accordance with 330 CMR 31.00 Plant Nutrient Application Requirements for

[101] Applicants shall follow EPA Method 180.1 to monitor for turbidity

[102] Base Flood Elevation (BFE) is the elevation of surface water resulting from a flood that has a 1% chance of equaling or exceeding that level in any given year. The BFE is shown on the Flood Insurance Rate Map (FIRM) for zones AE, AH, A1–A30, AR, AR/A, AR/AE, AR/A1– A30, AR/AH, AR/AO, V1–V30 and VE. (Source: https://www.fema.gov/node/404233).

Agricultural Land and Non-Agricultural Turf and Lawns. Further, fertilizer shall never be applied to a site when a rain event greater than 0.5 inches is forecast in the next 48 hours.

i. Pursuant to 314 CMR 3.11 (2)(a), all applicants who apply for coverage under the 2022 CGP and elect to carry out site inspections every 14 days shall also inspect sites within 24 hours of 0.25 inches of precipitation events or greater over 24 hours,or within 24 hours of a discharge that occurred due to snowmelt from 3.25 inches or greater of snow accumulation.[103] During the high flow periods in spring (i.e., months of April to June), inspection frequency shall be increased to once per week for all sites.

i. To determine whether 3.25 inches or greater of snow accumulation has occurred at a site, snowfall measurements can be taken at the site,[104] or theoperator can rely on similar information from a local weather forecast.

j. Implementing structural improvements, enhanced/resilient pollution prevention measures, and other mitigation measures can help to minimize impacts from stormwater discharges from major storm events such as hurricanes, storm surge, extreme/heavy precipitation,[105] and flood events. Pursuant to 314 CMR 3.11 (2)(a), if such stormwater control measures are already in place due to existing requirements mandated by other state, local or federal agencies, the SWPPP shall include a brief description of the controls and a reference to the existing requirement(s). If the site may be exposed to or has previously experienced suchmajor storm events[106], additional stormwater control measures that may be considered, and implemented as necessary, include, but are not limited to:

i. Reinforce materials storage structures to withstand flooding and additional exertion of force;

ii. Prevent floating of semi-stationary structures by elevating to the Base Flood Elevation (BFE) level or securing with non-corrosive device;

iii. When a delivery of exposed materials is expected, and a storm is anticipated within 48 hours, delay delivery until after the storm or storematerials as appropriate (refer to emergency procedures);

[103] This is the amount of snow that is equivalent to 0.25 inches of rain, based on information from the National Oceanic and Atmospheric Administration (NOAA) indicating that 13 inches of snow is, on average, equivalent to 1 inch of rain. See https://www.nssl.noaa.gov/education/svrwx101/winter/faq/.

[104] NOAA's National Weather Service has guidelines on snowfall measurements at https://www.weather.gov/jkl/snow_measurement. These guidelines recommend use of a "snowboard" (a piece of wood about 16 inches by 16 inches) that is placed in an unobstructed part of the site on a hard surface.

[105] Heavy precipitation refers to instances during which the amount of rain or snow experienced in a location substantially exceeds what is normal. What constitutes a period of heavy precipitation varies according to location and season. Heavy precipitation does not necessarily mean the total amount of precipitation at a location has increased— just that precipitation is occurring in more intense or more frequent events.

[106] To determine if your facility is susceptible to an increased frequency of major storm events that could impact the discharge of pollutants in stormwater, you may reference FEMA, NOAA, or USGS flood map products at https://www.usgs.gov/faqs/where-can-i-find-flood-maps?qt-news_science_products=0#qtnews_science_products.

iv. Temporarily store materials and waste above the Base Flood Elevation ***[EPA notes that it has deleted a footnote reference to the term "Base Flood Elevation" since the same footnote is already included in Part 9.1.2.g, above.]*** level;

v. Temporarily reduce or eliminate outdoor storage;

vi. Temporarily relocate any mobile vehicles and equipment to higher ground;

vii. Develop scenario-based emergency procedures for major storms that are complementary to regular stormwater pollution prevention planning andidentify emergency contacts for staff and contractors; and

viii. Conduct staff training for implementing your emergency procedures atregular intervals.

k. Pursuant to 314 CMR 3.11 (2)(a)6., and in accordance with MassDEP's obligation under 314 CMR 4.05(5)(e) to maintain surface waters free from pollutants in concentrations or combinations that are toxic to humans, aquatic life, or wildlife, permittees who seek coverage under the 2022 CGP and anticipate to carry out dust control shall limit their dust control methodology to using water only and specifically avoid using other techniques, such as solutions containing calcium chloride.

l. If MassDEP requests a copy of the Stormwater Pollution Prevention Plan (SWPPP) for any construction site at any time, the permittee shall submit the SWPPP to MassDEP within 14 days of such a request. MassDEP may conduct an inspection of any site covered by this permit to ensure compliance with state lawrequirements, including state water quality standards.

9.1.3 MTR10F000 Areas in the State of Vermont located at a federal facility

a. Earth disturbance at any one time is limited to five acres.

b. All areas of earth disturbance must have temporary or final stabilization within 14 days of the initial disturbance. After this time, disturbed areas must be temporarily or permanently stabilized in advance of any runoff producing event. A runoff producing event is an event that produces runoff from the construction site. Temporary stabilization is not required if precipitation is not forecast and work is to continue in the next 24-hours or if the work is occurring in a self-contained excavation (i.e. no outlet) with a depth of two feet or greater (e.g. house foundation excavation, utility trenches). Areas of a construction site that drain to sediment basins are not considered eligible for this exemption, and the exemption applies only to the excavated area itself.

c. Site inspections on active construction sites shall be conducted daily during the period from October 15 through April 15.

d. The use of chemical treatments (e.g. polymers, flocculants, and coagulants) for the settling and/or removal of sediment from stormwater runoff associated with construction and construction-related activities requires prior written approval and an approved site and project-specific plan, from the Vermont Agency of Natural Resources. In addition, the use of cationic polymers is prohibited unless approved by the Vermont Agency of Natural Resources under a site and project-specific plan.

e. Any applicant under EPA's CGP shall allow authorized Vermont Agency of Natural Resources representatives, at reasonable times and upon presentation of credentials, to enter upon the project site for purposes of inspecting the project and determining

compliance with this Certification.

f. The Vermont Agency of Natural Resources may reopen and alter or amend the conditions of this Certification over the life of the EPA 2022 Construction General Permit when such action is necessary to assure compliance with the VWQS.

9.2 EPA REGION 2

9.2.1 NYR10I000 Indian country within the State of New York

a. Saint Regis Mohawk Tribe

i. Any Responsible-Person/Decision-Maker required under the CGP to submit a Notice of Intent (NOI) to EPA for coverage under the CGP, must concurrently submit an electronic copy of the NOI to the SRMT Environmental Division, Water Resource Program Manager. Additionally, an electronic copy of the Notice of Termination (NOT) must be provided within three business days after electronic confirmation is received from EPA that the NOT has been accepted. The NOI and NOT must be electronically provided to the following addresses:

Mr. Tieman W. Smith
Water Resources Program Manager Saint Regis Mohawk Tribe
449 Frogtown Road
Akwesasne, NY 13655 Tiernan.Smith@srmt-nsn.gov 518.358.2272 ext. 5073

ii. Any Responsible-Person/Decision-Maker that is required as part of the CGP to prepare a Discharge Management Plan (OMP) or Storm Water Management Plan (SWMP) and/or Storm Water Pollution Prevention Plan (SWPPP) must submit an electronic copy of the DMP, SWMP and/or SWPPP to the SRMT Environment Division, Water Resources Program Manager IO business days prior to the start of construction of any work to be conducted under the CGP. The applicable documents must be provided to the electronic address listed above.

iii. Any Responsible-Person/Decision-Maker that is required under the CGP to submit an annual report to EPA must submit an electronic copy of the annual report concurrently to the SRMT Water Resource Program. Additionally, any correspondences between the applicant and EPA related to analytical data, written reports, corrective action, enforcement, monitoring, or an adverse incident must likewise be routed to the SRMT Water Resources Program at the above electronic address.

iv. An "Authorization to Proceed Letter" with site-specific mitigation requirements may be sent out to the permittee when a review of the NOI and OMP, SWMP and /or SWPPP on a case-by-case basis, is completed by the SRMT Environment Division, Water Resource Program. This approval will allow the application to proceed if all mitigation requirements are met.

b. Seneca Nation

i. Under Part 1.1.5 of the CGP, the Seneca Nation requests that an applicant must demonstrate that they meet the eligibility criteria listed in Appendix D (certify in your Notice of Intent (NOI) that you meet one of the eligibility criteria [Criterion A-F]) as well as species and critical habitats that are listed under the Seneca Nation's "Fishing and Conservation Laws" and the "Seneca Nation of Indians Comprehensive Conservation Law".

ii. The Tribal Historic Preservation Office (THPO) was established in 2000 after the Seneca Nation received a recognition letter from the National Park Service (NPS); therefore under Part 1.1.6 of the CGP (Appendix E) and prior to submitting a Notice of Intent (NOI) operators must complete the Nation's TPHO, Project Review Form (https://sni.org/media/246603/sni-thpo-project-review-form.pdf) and submit the completed form with associated information to the Tribal Historic Preservation Officer at 90 Ohi:yo' Way, Salamanca, NY 14779. Federal agencies engaging in construction activities must provide for construction review by a certified construction reviewer in accordance with 7 Del. C. §§4010 & 4013 and 7 DE Admin. Code 5101, subsection 6.1.6.

iii. Under Part 1.2 of the CGP, discharges must also follow the Section 13 of the Guide for Construction (Seneca Nation of Indians Source Water Code) and respectively, Council Resolution, dated April 13, 2013 (CN: R-04-13-13-11) to ensure that the health, safety and welfare of the citizens of the Seneca Nation, and all other within the Lands and Territories of the Seneca Nation of Indians, and to facilitate the adequate provisions of water through the elimination or prevention of ground water contamination in the vicinity of wells that supply drinking water for the Nation. The area is known as the Source Water Protection Area (SWPA) and specified activities are regulated within this SWPA, as cited in Section 13 of the Guide for Construction and Section VI, of CN: R-04-13-13-11.

iv. Under Part 1.4, any operator who seeks coverage of the CGP, and is required to submit a notice of intent NOI and Notice of Termination (NOT) (as necessary) to the EPA for coverage, under Part 1.4.2 must also submit a copy of the NOI to the Seneca Nation's Environmental Protection Department (EPD) within three business days of submittal to the EPA, (address shown below). Respectively, a copy of the NOT (as described under Part 8.3 of the CGP), which certifies that you have met the requirements of Part 8, must be provided within three business days after electronic confirmation is received from the EPA that the NOT has been accepted. In addition to a NOI and NOT, the Seneca Nation (Environmental Protection Department [EPD]) would require an Environmental Impact Assessment (EA) (Long Form), as shown in Section 2 of the Seneca Nation of Indians Laws, Ordinances & Policies (Guide for Construction), to be completed and submitted to the EPD prior to any project to determine whether the impacts from a project would create significant and detrimental effects to the Nation's lands, water (violate WQS), and environment. The NOI, NOT, and EA must be submitted electronically to epd@sni.org and provided to the following address:

Seneca Nation
Environmental Protection Department (EPD) Attn: Director of EPD
12837 Route 438
Irving, NY 14081

v. Under Part 3.0 of the CGP, discharges must be controlled as necessary to meet applicable WQS. The Seneca Nation is working actively towards finalizing and implementing the; therefore, the EPD would require an applicant to submit or grant access to the permit to obtain information on the impact of effluents on receiving waters, including the capability of receiving waters to support future designated uses and achieve the WQS of the Nation; and to advise prospective dischargers of discharge requirements, and coordinate with the appropriate

permitting agencies. As stated in the Decision Document, under Section 303(c) of the CWA, 33 U.S.C. § 1313(c), states develop, review, and revise (as appropriate) water quality standards for surface waters of the United States. At a minimum, such standards are to include designated water uses, water quality criteria to protect such uses, and an antidegradation policy. 40 C.F.R. § 131.6. In addition, under Section 401 of the CWA states may grant, condition, or deny "certification" for federally permitted or licensed activities that may result in a discharge to the waters of the United States 33 U.S.C. § 1341.

vi. Under Part 7.2.8(a)(b)(c) and for Part 9 of the CGP, the following Sections of the Seneca Nation's Guide for Construction shall be considered, in conjunction with the CGP:

(a) Section 1. Executive Order - To Establish a Policy for Governing Access to Nation Territories and Facilities by Officials of Foreign Government, dated March 31, 2011

(b) Section 3. Natural Resources Committee, Sand and Gravel Law (CN: R-06-24-05-08)

(c) Section 4. Fishing and Conservation Laws - Part 1.1.5 of the CGP

(d) Section 5. Seneca Nation of Indians Comprehensive Conservation Law, adopted January 14, 2012

(e) Section 9. Food is Our Medicine (FIOM) Program/Native Planting Policy (CN: R-03- 08-14-14)

(f) Section 10. Forestry Management Plan (CN: R-08-14-10-23)

(g) Section 11. Timber Ordinance #411-092, dated May 8, 1982

(h) Section 14. Flood Damage Prevention Local Law, dated September 27, 1988

(i) Section 16. Utilities Ordinance No. 87-100

(j) Authorizing Emergency Action and Contingency Plan to Restrain Pollution of Nations Waters, (Council Resolution: R-03-01-18-10), dated March 10, 2018 Seneca Nation of Indians Permit Application for Construction within Waterways Permit, Form NR98-01.00

9.3 EPA REGION 3

9.3.1 DCR100000 District of Columbia

a. Discharges authorized by this permit shall comply with the District of Columbia Water Pollution Control Act of 1984, as amended (DC Official Code § 8-103.01 and § 8-103.06, et seq.) to ensure that District of Columbia waters, waters in adjacent and downstream states, and the beneficial uses of these waters will not be harmed or degraded by the discharges.

b. Discharges authorized by this permit must comply with §§ 1104.1 and 1104.8 of Chapter 11 and the provisions of Chapter 19 of Title 21of District of Columbia Municipal Regulations in order to attain and maintain designated uses of the District of Columbia waters.

c. The permittee shall comply with the District of Columbia Stormwater Management and Soil Erosion and Sediment Control regulations in Chapter 5 of Title 21 of the District of Columbia Municipal Regulations.

d. The permittee shall comply with the District of Columbia Flood Management Control regulations in Chapter 31 of Title 20 of the District of Columbia Municipal Regulations.

e. The permittee shall submit a copy of the Stormwater Pollution Prevention Plan (SWPPP) to the Regulatory Review Division, Department of Energy & Environment, Government of the District of Columbia, 1200 First Street, NE, 5th Floor, Washington, DC 20002, during the review and approval of the permittee's DOEE Erosion and Sediment Control Plan in accordance with the provisions of Chapter 542 of Title 21 of the District of Columbia Municipal Regulations.

f. Upon request, the permittee shall submit all inspection and monitoring reports as required by this permit and 40 CFR § 122.41 to the Associate Director, Inspection and Enforcement Division, Department of Energy & Environment, Government of the District of Columbia, 1200 First Street, NE, 5th Floor, Washington, DC 20002; telephone (202) 535-2226, or by email at Joshua.Rodriguez@dc.gov.

g. In the event the permittee intends to discharge dewatering water, groundwater, or groundwater comingled with stormwater from a known contaminated site, the permittee shall contact the Regulatory Review Division, Department of Energy & Environment, Government of the District of Columbia, 1200 First Street, NE, 5th Floor, Washington, DC 20002; telephone (202) 535-2600, or by email at MS4DischargeAuthorization@dc.gov to request authorization to discharge dewatering water, groundwater, or groundwater comingled with stormwater to the District's Municipal Separate Storm Sewer System (MS4) or to a surface water body pursuant to §§ 8-103.02, 8-103.06, and 8-103.07 of the District of Columbia Water Pollution Control Act of 1984, as amended.

9.3.2 DER10F000 Areas in the State of Delaware located at a federal facility (as defined in Appendix A)

a. Federal agencies must submit a sediment and stormwater management plan (SSMP) and receive Department approval prior to undertaking any land clearing, soil movement or construction activity unless conducting an exempt activity.

b. Federal construction activities are required to have a third-party Certified Construction Reviewer (CCR) perform weekly reviews to ensure the adequacy of construction activities pursuant to the approved SSMP and regulations.

Implementation of approved SSMPs requires the daily oversight of construction activity by certified responsible personnel.

c. Implementation of approved SSMPs requires the daily oversight of construction activity by certified responsible personnel.

d. A current copy of the SSMP must be maintained at the construction site.

e. Unless authorized by the Department, not more than 20 acres may be disturbed at any one time.

9.4 EPA REGION 4

No additional conditions

9.5 EPA REGION 5

9.5.1 MIR10I000 Indian country within the State of Minnesota

a. Fond du Lac Reservation

i. New dischargers wishing to discharge to an Outstanding Reservation Resource Water (ORRW)[107] must obtain an individual permit from EPA for storm water discharges from large and small construction activities.

ii. A copy of the Storm Water Pollution Prevention Plan (SWPPP) must be submitted to the Office of Water Protection at least fifteen (15) days in advance of sending the Notice of Intent to EPA. The SWPPP can be submitted electronically to richardgitar@FDLREZ.com or by hardcopy sent to:

Fond du Lac Reservation
Office of Water Protection
1720 Big Lake Road
Cloquet, MN 55720

iii. Copies of the Notice of Intent (NOI) and the Notice of Termination (NOT) must be sent to the Fond du Lac Office of Water Protection at the same time they are submitted to EPA. [The condition helps the Office of Water Protection keep track of when a project is about to start and when it has ended. FDL Water Quality Certification Ordinance, Section 204 (a) (2)).

iv. If the project will entail a discharge to any watercourse or open water body, the turbidity limit shall NOT exceed 10% of natural background within the receiving water(s) as determined by Office of Water Protection staff. For such discharges, turbidity sampling must take place within 24 hours of a ½-inch or greater rainfall event. The results of the sampling must be reported to the Office of Water Protection within 7 days of the sample collection. All sample reporting must include the date and time, location (GPS: UTM/Zone 15), and NTU. CGP applicants are encouraged to work with the Office of Water Protection in determining the most appropriate location(s) for sampling. [This condition helps both the Office of Water Protection and the project proponent in knowing whether or not their erosion control efforts are effective. FDL Water Quality Certification, Section 204 (b) (1)).

v. Receiving waters with open water must be sampled for turbidity prior to any authorized discharge as determined by Office of Water Protection staff. This requirement only applies to receiving waters which no ambient turbidity data exists. [This condition allows the Office of Water Protection to obtain a baseline turbidity sample in which to compare to other samples. FDL Water Quality Certification Ordinance, Section 204 (b) (2)].

vi. All work shall be carried out in such a manner as will prevent violations of water quality criteria as stated in the Water Quality Standards of the Fond du Lac Reservation, Ordinance #12/98, as amended. This includes, but is not limited to, the prevention of any discharge that causes a condition in which visible solids, bottom deposits, or turbidity impairs the usefulness of water of the Fond du Lac

[107] Although additional waters may be designated in the future, currently Perch Lake, Rice Portage Lake, Miller Lake, Deadfish Lake, and Jaskari Lake are designated as ORRWs.

Reservation for any of the uses designated in the Water Quality Standards of the Fond du Lac Reservation. These uses include wildlife, aquatic life, warm water fisheries, cold water fisheries, subsistence fishing (netting), primary contact recreation, secondary contact recreation, cultural, wild rice areas, aesthetic waters, agriculture, navigation, commercial and wetlands. It also includes the designated uses of wetlands including, but not limited to, baseflow discharge, cultural opportunities, flood flow attenuation, groundwater recharge, indigenous floral and fauna) diversity and abundance, nutrient cycling, organic carbon export/cycling, protection of downstream water quality, recreation, resilience against climactic effects, sediment/shoreline stabilization, surface water storage, wild rice, and water dependent wildlife. [In addition to listing the designated uses of waters of the Fond du Lac Reservation, this condition also limits the project proponent to discharges that will not violate our Water Quality Standards. FDL Water Quality Certification Ordinance, Section 204 (a) (7)).

vii. Appropriate steps shall be taken to ensure that petroleum products or other chemical pollutants are prevented from entering waters of the Fond du Lac Reservation. All spills must be reported to the appropriate emergency management Agency (National Response Center AND the State Duty Officer), and measures shall be taken immediately to prevent the pollution of waters of the Fond du Lac Reservation, including groundwater. The Fond du Lac Office of Water Protection must also be notified immediately of any spill regardless of size. [This condition helps protect water quality and also reminds project proponents of their responsibility in reporting spill events. FDL Water Quality Certification Ordinance, Section 204 (b) (3)).

viii. All seed mixes, whether used for temporary stabilization or permanent seeding, shall NOT contain any annual ryegrass (Lolium species). Wild rye (Elymus species) or Oats (Avena species) may be used as a replacement in seed mixes. [This condition prevents the use of annual ryegrass on the Reservation. Annual ryegrass is allelopathic, which means it produces biochemical in its roots that inhibit the growth of native plants. If used in seed mixes, annual ryegrass could contribute to erosion, especially on slopes. However, the condition also specifies substitute grasses that germinate almost as fast as annual ryegrass for use as a cover crop to help prevent erosion. FDL Water Quality Certification Ordinance, Section 204 (t) (1)).

ix. To prevent the introduction of invasive species, ALL contractors and subcontractors MUST disclose information stating prior equipment location(s) and ALL known invasive species potentially being transported from said location(s). All equipment MUST undergo a high pressure wash (including any equipment mats) BEFORE ENTERING the Fond du Lac Reservation. Personal equipment such as work boots, gloves, vest, etc. MUST be clean of debris, dirt and plant and animal material BEFORE ENTERING the Fond du Lac Reservation. Equipment being transported from known infested areas MUST undergo a high pressure wash as soon as possible after leaving the infested site and again BEFORE ENTERING the Fond du Lac Reservation, to avoid transport of invasive species into areas surrounding the Reservation. Written certification of equipment cleaning MUST be provided to the Fond du Lac Office of Water Protection. Upon arrival, ALL contractor and subcontractor equipment will be inspected by appointed Fond du Lac staff. If equipment is deemed unsatisfactory, the equipment MUST

undergo a high pressure washing until the equipment is cleared by the inspector, until such time, minimal travel will be allowed through the Reservation. The contractor shall be held responsible for the control of any invasive species introduced as a result of their project. [This condition requires the project proponent to prevent the inadvertent introduction of invasive species by taking an active role in cleaning all vehicles, equipment, and equipment mats before entering the Reservation. This condition has been placed in certifications since 2012, due to the introduction of Wild Parsnip in 2011 from a pipeline contractor. It is much easier to prevent the introduction of an invasive species than it is to eradicate it once it has been introduced. Many invasive plant species form monocultures, preventing native plants from growing. This situation often leads to cases of erosion, which in turn effects water quality. FOL Water Quality Certification Ordinance, Section 204 (g) (1)].

x. A copy of this certification MUST be kept by the contractor on-site at all times and be available for viewing by all personnel, including inspectors. [This condition ensures that the information contained in the certification, especially the conditions, is readily available onsite for reference. FOL Water Quality Certification Ordinance, Section 204 (a) (9)].

b. The Grand Portage Band of Lake Superior Chippewa

i. The CGP authorization is for construction activities that may occur within the exterior boundaries of the Grand Portage Reservation in accordance to the Grand Portage Land Use Ordinance. The CGP regulates stormwater discharges associated with construction sites of one acre or more in size. Only those activities specifically authorized by the CGP are authorized by this certification (the "Certification").

ii. All construction stormwater discharges authorized by the CGP must comply with the Water Quality Standards and Water Resources Ordinance, as well as Applicable Federal Standards (as defined in the Water Resources Ordinance).

iii. All appropriate steps must be taken to ensure that petroleum products or other chemical pollutants are prevented from entering the Waters of the Reservation. All spills must be reported to the appropriate emergency-management agency, and measures must be taken to prevent the pollution of the Waters of the Reservation, including groundwater.

iv. The 2022 CGP requires inspections and monitoring reports of the construction site stormwater discharges by a qualified person. Monitoring and inspection reports must comply with the minimum requirements contained in the 2022 CGP. The monitoring plan must be prepared and incorporated into the Storm Water Pollution Prevention Plan (the "SWPP"). A copy of the SWPP must be submitted to the Board at least 30 days in advance of sending the requisite Notice of Intent to EPA. The SWPP should be sent to:

Grand Portage Environmental Resources Board

P.O. Box 428

Grand Portage, MN 55605

Copies of the Notice of Intent and Notice of Termination required under the General Permit must be submitted to the Board at the address above at the same time they are submitted to the EPA.

v. If requested by the Grand Portage Environmental Department, the permittee must provide additional information necessary for a case-by-case eligibility determination to assure compliance with the Water Quality Standards and any Applicable Federal Standards. The burden is on the applicant to demonstrate compliance with the Water Quality Standards, the Water Resources Ordinance, and Applicable Federal Standards whether or not the application is ultimately eligible for the CGP.

vi. CGP discharges must not cause nuisance conditions as defined in Grand Portage Water Quality Standards.

vii. The Board retains full authority to ensure compliance with and to enforce the provisions of the Water Resource Ordinance and Water Quality Standards, Applicable Federal Standards, and these Certification conditions. Nothing herein affects the scope or applicability of other controlling tribal or federal requirements, including but not limited to impacts to cultural, historical, or archeological features or sites, or properties that may be eligible for listing on the National Register of Historic Places under the National Historic Preservation Act, 54 U.S.C. §§ 300101 et seq.

viii. Appeals related to Board actions taken in accordance with any of the preceding conditions may be heard by the Grand Portage Tribal Court.

c. Leech Lake Band of Ojibwe

i. The water quality standards that apply to the construction site are the standards at the time the operator submits its Notice of Intent (NOI) to EPA and the LLBO WRP (see conditions # 2 and # 3).

ii. A copy of the Stormwater Pollution Prevention Plan (SWPPP) must be submitted to the LLBO WRP at least 30 days in advance of sending the NOI for the project to EPA. See attached LLBO 401 Water Quality Certification Ordinance. Section 304(a)(1). The SWPPP should be submitted electronically to Jeff.Harper@llojibwe.net and by hardcopy sent to:

Leech Lake Band of Ojibwe
ATTN: Water Resources Program - 401 Cert
Division of Resource Management
190 Sailstar Drive NW
Cass Lake, Minnesota 56633

iii. Copies of the NOI and the Notice of Termination (NOT) must be submitted to the LLBO WRP at the same time they are submitted to EPA. See attached LLBO 401 Water Quality Certification Ordinance, Section 304(a)(2). The NOI and NOT should be submitted electronically to Jeff.Harper@llojibwe.net and sent by hardcopy to the address cited in condition # 2.

iv. Any and all other conditions listed in Section 304 of the attached LLBO 401 Water Quality Certification Ordinance shall be observed unless the LLBO WRP deems that certain conditions therein are not applicable to the project in need of a permit under this certification.

v. A copy of this certification MUST be kept by the contractor on-site at all times and be available for viewing by all personnel, including inspectors.

vi. Upon consideration of the NOI, if the LLBO WRP finds that the discharge will not be controlled as necessary to meet applicable water quality standards, the LLBO

WRP may insist, consistent with Part 3.1 of the CGP, that additional controls are installed to meet applicable water quality standards, or recommend to EPA that the operator obtain coverage under an individual permit.

9.5.2 WIR10I000 Indian country within the State of Wisconsin

a. Bad River Band of Lake Superior Tribe of Chippewa Indians

i. Only those activities specifically authorized by the CGP are authorized by this Certification. This Certification does not authorize impacts to cultural properties, orhistorical sites, or properties that may be eligible for listing as such.

ii. All projects which are eligible for coverage under the CGP and are located within the exterior boundaries of the Bad River Reservation shall be implemented in such a manner that is consistent with the Tribe's Water Quality Standards (WQS). The Tribe's WQS can be viewed at: http://www.badriver-nsn.gov/wp-content/uploads/2020/01/NRD_WaterQualityStandards_2011.pdf

iii. Operators are not eligible to obtain authorization under the CGP for all new discharges to an Outstanding Tribal Resource Water (OTRW or Tier 3 water). OTRWs, or Tier 3 waters, include the following: Kakagon Slough and the lower wetland reaches of its tributaries that support wild rice, Kakagon River, Bad River Slough, Honest John Lake, Bog Lake, a portion of Bad River, from where it enters the Reservation through the confluence with the White River, and Potato River. OTRWs can be viewed at: https://www.arcgis.com/apps/View/index.html?appid=6f44c371217e4ee8b5f1c2c705c 7c7c5

iv. An operator proposing to discharge to an Outstanding Resource Water (ORW or Tier 2.5 water) under the CGP must comply with the antidegradation provisions of the Tribe's WQS. ORWs, or Tier 2.5 waters, include the following: a portion of Bad River, from downstream the confluence with the White River to Lake Superior, White River, Marengo River, Graveyard Creek, Bear Trap Creek, Wood Creek, Brunsweiler River, Tyler Forks, Bell Creek, and Vaughn Creek. ORWs can be viewed at: https://www.arcgis.com/apps/View/index.html?appid=6f44c371217e4ee8b5f1c2c705c 7c7c5. The antidegradation demonstration materials described in provision E.4.iii., and included on the antidegradation demonstration template found at: https://www.badriver-nsn.gov/natural-resources/projectreviews/, must be submitted to the following address:

Bad River Tribe's Natural Resources Department
Attn: Water Regulatory Specialist
P.O. Box 39 Odanah, WI 54861
WaterReg@badriver-nsn.gov

v. An operator proposing to discharge to an Exceptional Resource Water (ERW or Tier 2 water) under the CGP must comply with the antidegradation provisions of the Tribe's WQS. ERWs, or Tier 2 waters, include the following: any surface water within the exterior boundaries of the Reservation that is not specifically classified as an Outstanding Resource Water (Tier 2.5 water) or an Outstanding Tribal Resource Water (Tier 3 water). ERWs can be viewed at: https://www.arcgis.com/apps/View/index.html?appid=6f44c371217e4ee8b5f1c2c705c 7c7c5. The antidegradation demonstration materials described in provision

E.4.ii., and included on the antidegradation demonstration template found at: https://www.badriver-nsn.gov/natural-resources/projectreviews/, must be submitted to the following address:

Bad River Tribe's Natural Resources Department
Attn: Water Regulatory Specialist
P.O. Box 39 Odanah, WI 54861
WaterReg@badriver-nsn.gov

vi. Projects utilizing cationic treatment chemicals within the Bad River Reservation boundaries are not eligible for coverage under the CGP.

vii. A discharge to a surface water within the Bad River Reservation boundaries shall not cause or contribute to an exceedance of the turbidity criterion included in the Tribe's WQS, which states: Turbidity shall not exceed 5 NTU over natural background turbidity when the background turbidity is 50 NTU or less, or turbidity shall not increase more than 10% when the background turbidity is more than 50 NTU.

viii. All projects which are eligible for coverage under the CGP within the exterior boundaries of the Bad River Reservation must comply with the Bad River Reservation Wetland and Watercourse Protection Ordinance, or Chapter 323 of the Bad River Tribal Ordinances, including the erosion and sedimentation control, natural buffer, and stabilization requirements. Questions regarding Chapter 323 and requests for permit applications can be directed to the Wetlands Specialist in the Tribe's Natural Resources Department at (715) 682-7123 or wetlands@badriver-nsn.gov.

ix. An operator of a project, which is eligible for coverage under the CGP, that would result in an allowable discharge under the CGP occurring within the exterior boundaries of the Bad River Reservation must notify the Tribe prior to the commencing earth-disturbing activities. The operator must submit a copy of the Notice of Intent (NOI) to the following addresses at the same time it is submitted to the U.S. EPA:

Bad River Tribe's Natural Resources Department
Attn: Water Regulatory Specialist
P.O. Box 39 Odanah, WI 54861
WaterReg@badriver-nsn.gov

Bad River Tribe's Natural Resources Department
Attn: Tribal Historic Preservation Officer (THPO)
P.O. Box 39 Odanah, WI 54861
THPO@badriver-nsn.gov

The operator must also submit a copy of the Notice of Termination (NOT) to the above addresses at the same time it is submitted to the U.S. EPA. Photographs showing the current site conditions must be included as part of the NOT to document the stabilization requirements have been met.

x. The THPO must be provided 30 days to comment on the project.

xi. The operator must obtain THPO concurrence in writing. This written concurrence will outline measures to be taken to prevent or mitigate effects to historic

properties. For more information regarding the specifics of the cultural resources process, see 36 CFR Part 800. A best practice for an operator is to consult with the THPO during the planning stages of an undertaking.

xii. An operator of a project, which is eligible for coverage under the CGP, that would result in an allowable discharge under the CGP occurring within the exterior boundaries of the Bad River Reservation must submit a copy of the Stormwater Pollution Prevention Plan (SWPPP) to the following address at the same time as submitting the NOI:

Bad River Tribe's Natural Resources Department

Attn: Water Regulatory Specialist

P.O. Box 39 Odanah, WI 54861

WaterReg@badriver-nsn.gov

xiii. Any corrective action reports that are required under the CGP must be submitted to the following address within one (1) working day of the report completion:

Bad River Tribe's Natural Resources Department

P.O. Box 39 Odanah, WI 54861

WaterReg@badriver-nsn.gov

xiv. An operator of a project, which is eligible for coverage under the CGP, that would result in an allowable discharge under the CGP occurring within the exterior boundaries of the Bad River Reservation must submit a copies of the inspection reports (including photographs) to the following address within 24 hours of completing any site inspection required:

Bad River Tribe's Natural Resources Department Attn: Water Regulatory Specialist

P.O. Box 39 Odanah, WI 54861

WaterReg@badriver-nsn.gov

xv. An operator shall be responsible for meeting any additional permit requirements imposed by the U.S. EPA necessary to comply with the Tribe's antidegradation policies if the discharge point is located upstream of waters designated by the Tribe.

9.6 EPA REGION 6

9.6.1 NMR100000 State of New Mexico, except Indian country

a. In Outstanding National Resource Waters (ONRWs) in New Mexico, no degradation is permitted except in limited, specifically defined instances. Therefore, Operators are not eligible to obtain authorization under this general permit for stormwater discharges to waters classified as ONRWs listed in Paragraph D of 20.6.4.9 New Mexico Administrative Code (NMAC), also referred to as "Tier 3 waters" as defined in Appendix A of this permit. Exception: When construction activities are in response to a public emergency (e.g., wildfire, extreme flooding, etc.) and the related work requires immediate authorization to avoid a threat to public health or safety.

i. Operators who conduct construction activities in response to a public emergency to mitigate an immediate threat to public health or safety shall adhere to the requirements in 20.6.4.8(A)(3)(c) NMAC, including notifying the New Mexico Environment Department (NMED) within seven days of initiation of

the emergency action and providing NMED with a summary of the action taken within 30 days of initiation of the emergency action.

ii. For all other scenarios, Operators with proposed discharges to ONRWs in New Mexico shall obtain coverage from EPA under an NPDES Individual Permit and will comply with the additional standards and regulations related to discharges to ONRWs in 20.6.4.8(A) NMAC. Additional information is available from:

New Mexico Environment Department Surface Water Quality Bureau
P.O. Box 5469
Santa Fe, NM 87502-5469 Telephone: 505-827-0187
https://www.env.nm.gov/surface-water-quality/wqs/
https://gis.web.env.nm.gov/oem/?map=swqb

b. If construction dewatering activities are anticipated at a construction site and non-stormwater discharges of groundwater, subsurface water, spring water, and/or other dewatering water are anticipated, the Operators/Permittees must complete the following steps:

1. Review the state's Ground Water Quality Bureau Mapper (https://gis.web.env.nm.gov/GWQB/) and Petroleum Storage Tank Bureau Mapper (https://gis.web.env.nm.gov/GWQB/).

   Check if the following sources are located within the noted distance from the anticipated construction dewatering activity. At a minimum, a list of the following potential sources of contaminants and pollutants at the noted distance is to be kept in the SWPPP.

Source of Potential Contamination or Pollutants*	Constituents likely to be required for testing*
Within 0.5 mile of an open Leaking Underground Storage Tank (LUST) site	BTEX (Benzene, Toluene, Ethylbenzene, and Xylene) plus additional parameters depending on site conditions**
Within 0.5 mile of an open Voluntary Remediation site	All applicable parameters or pollutants listed in 20.6.4.13, 20.6.4.52, 20.6.4.54, 20.6.4.97 thru 20.6.4.99, 20.6.4.101 through 20.6.4.899, and 20.6.4.900 NMAC (or an alternate list approved by the NMED-SWQB)*
Within 0.5 mile of an open RCRA Corrective Action Site	
Within 0.5 mile of an open Abatement Site	
Within 0.5 mile of an open Brownfield Site	
Within 1.0 mile or more of a Superfund site or National Priorities List (NPL) site with associated groundwater contamination.	
Construction activity contaminants and/or natural water pollutants	Additional parameters depending on site activities and conditions (Contact NMED- SWQB for an alternate list)*

*For further assistance determining whether dewatering may encounter contaminated sources, please contact the NMED Ground Water Quality Bureau at 505-827-2965 or NMED Surface Water Quality Bureau (SWQB) at 505-827-0187.

** EPA approved sufficiently sensitive methods must be used. For known PCB sources and analysis, EPA Method 1668C must be used (see https://www.epa.gov/cwa-methods).

2. If dewatering activities are anticipated, information on the flow rate and potential to encounter contaminated groundwater, subsurface water, spring water, or dewatering water must be provideddirectly to NMED at the following address:

   NMED Surface Water Quality Bureau

   Program Manager, Point Source Regulation
   SectionPO Box 5469, Santa Fe, NM 87502

   Please call the SWQB to obtain the appropriate email address (505-827-0187).

3. In addition, the Operator/Permittee must characterize the quality of the groundwater and subsurface water, spring water, or dewatering water being considered for discharge according to the table above and including dissolved hardness and pH. Considering the contaminant sources listed in the table above, water quality data may already be available. For further assistance, contactthe

NMED Surface Water Quality Bureau (505-827-0187), Ground Water Quality Bureau (505-827- 2965), Petroleum Storage Tank Bureau (505-476-4397), or Hazardous Waste Bureau (505-476- 6000).

i. The Operator/Permittee must submit recent analytical test results (i.e., within the past 5 years) according to the table above, and including dissolved hardness and pH, to the EPA Region 6 Stormwater Permit Contact and the NMED Surface Water Quality Bureau (see contact information in #2 above). If the test data exceed applicable water quality standards, then the groundwater, subsurface water, spring water, or dewatering water cannot be discharged into surface waters under this general permit. Operators/Permittees may submit an NPDES Individual Permit application to treat and discharge to waters of the U.S. or find alternative disposal measures. No discharges to surface waters are allowed until authorized.

ii. If the discharge has the potential to affect groundwater (e.g., land application), the Operator/Permittee must submit an NOI to the NMED Ground Water Quality Bureau (see 20.6.2.1201 NMAC – Notice of Intent to Discharge).

4. The Operator/Permittee must document any findings and all correspondence with NMED and EPA in the SWPPP.

c. Operators who intend to obtain authorization under this permit for new and existing storm water dischargesfrom construction sites must satisfy the following condition:

i. The SWPPP must include site-specific interim and permanent stabilization, managerial, and structural solids, erosion and sediment control best management practices (BMPs) and/or other controls that are designed to prevent to the maximum extent practicable an increase in the sediment yield and flow velocity from pre-construction, pre-development conditions to assure thatapplicable standards in 20.6.4 NMAC, including the antidegradation policy, and TMDL waste load allocations (WLAs) are met. This requirement applies to discharges both during construction and after construction operations have been completed. The SWPPP must identify and document the rationale for selecting these BMPs and/or other controls. The SWPPP must also describe design specifications, construction specifications, maintenance schedules (including a long-term maintenance plan), criteria for inspections, and expected performance and longevity of these BMPs.For sites greater than 5 acres in size, BMP selection must be made based on the use of appropriatesoil loss prediction models (i.e. SEDCAD, RUSLE, SEDIMOT, MULTISED, etc.) OR equivalent generallyaccepted (by professional erosion control specialists) soil loss prediction tools.

ii. For all sites, the Operator(s) must demonstrate, and include documentation in the SWPPP, that implementation of the site-specific practices will ensure that the applicable standards and TMDL WLAs are met, and will result in sediment yields and flow velocities that, to the maximum extent practicable, will not be greater than the sediment yield levels and flow velocities from preconstruction, pre-development conditions.

iii. All SWPPPs must be prepared in accordance with good engineering practices by qualified (e.g., CPESC certified, engineers with appropriate training) erosion control specialists familiar with the use of soil loss prediction models and design of

erosion and sediment control systems based on these models (or equivalent soil loss prediction tools). Qualifications of the preparer (e.g., professional certifications, description of appropriate training) must be documented in the SWPPP.The Operator(s) must design, implement, and maintain BMPs in the manner specified in the SWPPP.

NMED supports the use of EPA's small residential lot template if a site qualifies to use it as explained inthe permit, as long as it is consistent with the above requirements. NMED's requirement does not preclude small residential sites from using the template, but it may require an additional short paragraphto justify the selection of specific BMPs for the site.

d. Operators must notify NMED when discharges of toxic or hazardous substances or oil from a spill or other release occurs - see Emergency Spill Notification Requirements, Part 2.3.6 of the permit. For emergencies, Operators can call 505-827-9329 at any time. For non-emergencies, Operators can call 866-428-6535 (voice mail 24-hours per day) or 505-476-6000 during business hours from 8am-5pm, Monday through Friday. Operators can also call the NMED Surface Water Quality Bureau directly at 505-827-0187.

e. Operators of small construction activities (i.e., 1-5 acres) are not eligible to qualify for a waiver in lieu of needing to obtain coverage under this general permit based on Item C.3 of Appendix C (Equivalent Analysis Waiver) in the State of New Mexico.

9.6.2 NMR10I000 Indian country within the State of New Mexico, except Navajo Reservation Lands that are covered under Arizona permit AZR10000I and Ute Mountain Reservation Lands that are covered under Colorado permit COR10000I.

a. Nambe Pueblo

i. The operator must provide a copy of the Notice of Intent (NOI) and Notice of Termination (NOT) to the Nambe Pueblo Governor's Office at the same time it is provided to the US Environmental Protection Agency. The NOI and NOT should be provided to the following address:

Office of the Governor Nambe Pueblo

!SA NPI02 WEST

Nambe Pueblo, New Mexico 87506

ii. The operator must provide a copy of the Storm Water Pollution Prevention Plan (SWPPP) to Nambe Pueblo at the same time it is submitted to the EPA, either by email to governor@nambepueblo.org or mailed to the above address.

iii. The operator must provide copies of inspection reports, a copy of the corrective action log, and modifications made to the SWPPP as a result of inspection findings, upon request by the Nambe Pueblo Department of Environmental and Natural Resources or Nam be Governor.

b. Ohkay Owingeh Tribe

i. All operators obtaining permit coverage under the EPA CGP, must submit a copy of the certified (signed) Notice of Intent (NOI) to the Ohkay Owingeh Office of Environmental Affairs, a copy of NOI modifications and the Notice of Termination (NOT), must be provided within three business days after EPA provides electronic confirmation that the submission has been received. The NOI and NOT must be

provided to the following address:

Naomi L. Archuleta - Environmental Programs Manager Ohkay Owingeh Office of Environmental Affairs
P.O. Box 717
Ohkay Owingeh, NM 87566
naomi.archuleta@ohkay.org

Noah Kaniatobe - Environmental Specialist Ohkay Owingeh, Office of Environmental Affairs
P.O. Box 717
Ohkay Owingeh, NM 87566
noah.kaniatohe@ohkay.org

ii. All operators obtaining permit coverage under the EPA CGP, must submit an electronic copy of the Storm Water Pollution Prevention Plan (SWPPP) to Ohkay Owingeh Office of Environmental Affairsat the same time that the NOI is submitted to the tribe (see contact information listed above).

iii. Following each incident where the operator takes a corrective action the operator must provide thecorrective action log to the Ohkay Owingeh Office of Environmental Affairs.

iv. The operator must notify Ohkay Owingeh Office of Environmental Affairs within 24 hours, in the event of an emergency spill in addition to the notification requirements at Part 2.3.6 of the CGP. Please contact: Ohkay Owingeh Tribal Police Department at 505.852.2757.

Please contact:
Ohkay Owingeh
Tribal Police Department
505.852.2757

c. Pueblo of Isleta

i. All operators obtaining permit coverage under the EPA CGP must submit a copy of the certified Notice ofIntent (NOI) to the Pueblo of Isleta at the same time it is submitted to EPA for projects occurring within the exterior boundaries of the Pueblo of Isleta. Additionally, a copy of NOI modifications and the Notice of Termination (NOT), must be provided within three business days after EPA provides electronic confirmation that the submission has been received. The Notices must be provided to the following address:

Water Quality Control OfficerPueblo of Isleta
Environment DepartmentPO Box 1270
Isleta NM 87022
505-869-7565
WQCO@isletapueblo.com

ii. The operator must notify the Pueblo of Isleta's Dispatch at 505-869-3030 as soon as possible and thePueblo of Isleta Water Quality Control Officer within 10 hours, in the event of a spill of hazardous ortoxic substances or if health or the

environment become endangered in addition to the notification requirements at Part 2.3.6 and at I.12.6.1 of the CGP.

iii. All operators obtaining permit coverage under the EPA CGP must submit an electronic copy of the Stormwater Pollution Prevention Plan (SWPPP) to the Pueblo of Isleta Water Quality Control Officer atthe above address, 30 days prior to submitting the certified NOI to EPA. If the electronic file is too largeto send through e-mail, a zip file or flash drive may be submitted.

iv. All operators obtaining permit coverage under the EPA CGP must give 2 days advance notice to the Pueblo of Isleta Water Quality Control Officer of any planned changes in the permitted activity whichmay result in noncompliance with permit requirements.

v. All operators obtaining permit coverage under the EPA CGP must post a sign or other notice of permit coverage at a safe, publicly accessible location in close proximity to the construction site. The notice mustbe located so that it is visible from the public road or tribal road that is nearest to the active part of the construction site. The sign must be maintained on-site from the time construction activities begin until final stabilization is met.

vi. Erosion and sediment controls shall be designed to retain sediment on-site and project-generatedwaste materials that have the potential to discharge pollutants shall not be placed on open soil oron a surface that is not stabilized. Volumes of sediment over five (5) cubic yards must be removed from the active construction site; additionally, if sediment is placed for disposal withinthe exterior boundaries of the Pueblo of Isleta, disposal must be within a tribally approved sediment disposal site.

d. Pueblo of Laguna

i. All operators obtaining permit coverage under the EPA CGP must submit an electronic copy of the certified (signed) Notice of Intent (NOI) to the Pueblo of Laguna's Environmental & Natural Resources Department (ENRD) within three business days of submittal to the EPA. Additionally, a copy of NOI modifications and the Notice of Termination (NOT), must be provided within three business days after the EPA provides electronic confirmation that the submission has been received. The NOI and NOT must be electronically submitted to info.environmental@pol-nsn.gov.

ii. All operators obtaining permit coverage under the EPA CGP must submit an electronic copy of the Stormwater Pollution Prevention Plan (SWPPP) to the Pueblo of Laguna's ENRD 14 days prior to the submittal of the NOI (see contact information listed above).

iii. The operator must provide copies of corrective actions logs and modifications made to the SWPPP as a result of inspection findings to the Pueblo of Laguna ENRD (see contact information above).

iv. In addition to the notification requirements of Part 2.3.6 of the CPG ***[EPA interprets this intending to refer to the CGP]***, the operator must notify the Pueblo of Laguna ENRD at 505-552-7512 in the event of an emergency spill as soon as possible.

e. Pueblo of Sandia. The following conditions apply only to discharges on the Pueblo of Sandia Reservation:

i. All operators obtaining permit coverage under the EPA CGP, must submit a copy of the certified (signed) Notice of Intent (NOI) to the Pueblo of Sandia Environment Department concurrently with submittal to the EPA. Additionally, a copy of NOI modifications and the Notice of Termination (NOT), must be provided concurrently with submittal to the EPA. The NOI and NOT must be provided electronically to the following addresses:

Electronic Addresses:

Amy Rosebrough (Water Quality Manager): rosebrough@sanidapueblo.nsn.us
Greg Kaufman (Environment Director):gkaufman@sandiapueblo.nsn.us

ii. All operators obtaining permit coverage under the EPA CGP, must submit an electronic copy of the Stormwater Pollution Prevention Plan (SWPPP) to the Pueblo of Sandia Environment. Department at least 14 days prior to submittal of the NOI to the Pueblo (see contact information listed above).

iii. If requested by the Pueblo of Sandia Environment Department, the permittee must provide additional information necessary on a case-by-case basis to assure compliance with the Pueblo of Sandia Water Quality Standards and/or applicable Federal Standards.

iv. An "Authorization to Proceed Letter" with site specific mitigation requirements may be sent out to the permittee when a review of the NOI and SWPPP, on a case-by-case basis, is completed by the Pueblo of Sandia Environment Department. This approval will allow the application to proceed if all mitigation requirements are met.

v. The Pueblo of Sandia will not allow Small Construction Waivers (Appendix C) to be granted for any small construction activities.

vi. The operator must provide copies of inspection reports, a copy of the corrective action log, and modifications made to the SWPPP as a result of inspection findings to the Pueblo of Sandia Environment Department upon request. An inspection report and corrective action log must be submitted to the Pueblo within 3 days of any inspection that results in corrective action (see contact information listed above).

vii. The operator must notify the Pueblo of Sandia within 24 hours in the event of an emergency spill, in addition to the notification requirements at Part 2.3.6 of the COP (see contact information listed above).

viii. Before submitting a Notice of Termination (NOT) to the EPA, permittees must clearly demonstrate to the Pueblo of Sandia Environment Department through a site visit or documentation that requirements for site stabilization have been met and any temporary erosion control structures have been removed. A short letter stating that the NOT is acceptable and all requirements have been met will be sent to the permittee to add to the permittee's NOT submission to the EPA.

f. Pueblo of Santa Ana. The following conditions apply only to discharges on the Pueblo of Santa Ana Reservation:

i. All operators obtaining permit coverage under the EPA CGP, must submit a copy of the certified (signed) Notice of Intent (NOI) to the Pueblo's Department of Natural Resources within three business days of submittal to EPA. Additionally, a copy of NOI modifications and the Notice of Termination (NOT), must be

provided within three business days after EPA provides electronic confirmation that the submission has been received. The NOI and NOT must be provided to the following address:

Regular U.S. Delivery Mail:
Pueblo of Santa Ana
Department of Natural Resources Water Resources Division
Attn: Andrew Sweetman 02 Dove Rd
Santa Ana Pueblo, NM 87004

Electronically:
Andrew Sweetman
Water Resources Division Manager Andrew.Sweetman@santaana-nsn.gov
Tammy Montoya Hydrologist
Tammy.Montoya@santaana-nsn.gov

ii. All operators obtaining permit coverage under the EPA CGP, must submit an electronic copyof the Stormwater Pollution Prevention Plan (SWPPP) to the to the Pueblo's Department of Natural Resources at the same time that the NOI is submitted to the tribe (see contact information listed above).

iii. The operator must provide copies of inspection reports, a copy of the corrective action log, and modifications made to the SWPPP as a result of inspection findings, upon request by the Pueblo's Department of Natural Resources.

iv. The operator must notify the Pueblo's Department of Natural Resources within 24 hours in the event of an emergency spill, in addition to the notification requirements at Part 2.3.6 of the CGP.

g. Pueblo of Taos

i. All operators obtaining permit coverage under the EPA CGP, must submit a copy of the certified (signed) Notice of Intent (NOi) to the Taos Pueblo Environmental Office and Taos Pueblo Governor's Office within three business days of submittal to EPA. Additionally, a copy of NOi modifications and the Notice of Termination (NOT), must be provided within three business days after EPA provides electronic confirmation that the submission has been received. The NOi and NOTmust be provided to the following addresses:

Honorable Governor of Taos Pueblo PO Box 1846
Taos, New Mexico 87571

Taos Pueblo Environmental Office PO Box 1846
Taos, New Mexico 87571

ii. All operators obtaining permit coverage under the EPA CGP, must submit an electronic copy of theStormwater Pollution Prevention Plan (SWPPP) to the Taos Pueblo Environmental Office when the NOI is submitted to the tribe. Electronic copy of SWPPP downloaded on flash drive may be sent to the above address for the Taos Pueblo Environmental Office.

iii. The operator must provide a copy of the corrective action log following each corrective action undertaken and modifications made to the SWPPP as a result of

a corrective action to the Taos Pueblo Environmental Office at address listed above.

h. Pueblo of Tesuque.

i. All operators obtaining permit coverage under the EPA CGP, must submit a copy of the certified (signed) Notice of Intent (NOI) to the Pueblo of Tesuque Department of Environment and Natural Resources (DENR) and the Pueblo's Governor within three business days of submittal to EPA. Additionally, a copy of any NOi modifications and the Notice of Termination (NOT), must be provided within three business days after EPA provides electronic confirmation that the submission has been received. The NOI and NOT must be provided to the following address:

Governor Mark Mitchell Pueblo of Tesuque
20 TP 828
Santa Fe, NM 87506 governor@pueblooftesuque.org

Sage Mountain.flower Pueblo of Tesuque
Department of Environment and Natural Resources Director
20 TP 828

ii. All operators obtaining permit coverage under the EPA CGP, must submit an electronic copyof the Stormwater Pollution Prevention Plan (SWPPP) to Pueblo of Tesuque DENR and the Pueblo's Governor at the same time that the NO! is submitted to the EPA (see contact information listed above).

iii. The operator must provide a copy of the corrective action log, and any modifications made tothe SWPPP as a result of inspection findings, or upon request by the Pueblo of Tesuque DENR.

iv. The operator must notify the Pueblo of Tesuque DENR within 24 hours in the event of an emergency spill, in addition to the notification requirements at Part 2.3.6 of the CGP (seecontact information listed above).

i. Santa Clara Indian Pueblo.

i. All operators obtaining permit coverage under the EPA CGP, must submit a copy of the certified (signed) Notice of Intent (NOI) to the Santa Clara Pueblo Office of Environmental Affairs at the same time the NOI is submitted to the U.S. EPA. Additionally, a copy of the NOI modifications and the Notice of Termination (NOT), must be provided at the same time after electronic confirmation is received from EPA that the NOT has been accepted. The NOI and NOT shall be provided to the following address in electronic format:

Dino Chavarria,
Santa Clara Pueblo
Office of Environmental Affairs
dinoc@santaclarapueblo.org

ii. All operators obtaining permit coverage under the EPA CGP, must submit an electronic copy of the Stormwater Pollution Prevention Plan to the Santa Clara Pueblo Office of Environmental Affairs at the same time the NOI is submitted to the U.S. EPA (see contact information listed above).

iii. The operator must notify the Santa Clara Pueblo Office of Environmental Affairs at the address above within 24 hours, in the event of an emergency spill, in addition to the notification requirements at Part 2.3.6 of the CGP

9.6.3 OKR10I000 Indian country within the State of Oklahoma, except areas of Indian country covered by an extension of state program authority pursuant to Section 10211 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act (SAFETEA).

a. Pawnee Nation. The following conditions apply only to discharges within Pawnee Indian country:

i. Copies of the Notice of Intent (NOI) and Notice of Termination (NOT) must be provided to the Pawnee Nation at the same time it is submitted to the Environmental Protection Agency to the following address:

Pawnee Nation Department of Environmental Conservation and Safety
P.O. Box 470
Pawnee, OK 74058
Or email to dnrs@pawneenation.org

ii. An electronic copy of the Storm Water Pollution Prevention Plan (SWPPP) must be submitted to the Pawnee Nation Department of Environmental Conservation and Safety at the same time the NOI is submitted.

iii. The operator must provide access to the site for inspections and for copies of inspection reports, copy of the corrective action log and modifications, made to the SWPPP because of inspection findings, upon request by the Pawnee Nation DECS.

iv. The Pawnee Nation Department of Environmental Conservation and Safety must be notified at 918.762.3655 immediately upon discovery of any noncompliance with any provision of the permit conditions.

9.6.4 OKR10F000 Discharges in the State of Oklahoma that are not under the authority of the Oklahoma Department of Environmental Quality, or the Oklahoma Department of Agriculture and Forestry including activities associated with oil and gas exploration, drilling, operations, and pipelines (includes SIC Groups 13 and 46, and SIC codes 492 and 5171), and point source discharges associated with agricultural production, services, and silviculture (includes SIC Groups 01, 02, 07, 08, 09).

a. For activities located within the watershed of any Oklahoma Scenic River, including the Illinois River, Flint Creek, Barren Fork Creek, Upper Mountain Fork, Little Lee Creek, and Lee Creek or any water or watershed designated "ORW" in Oklahoma's Water Quality Standards, this permit may only be used to authorize discharges from temporary construction activities. Certification is denied for any on-going activities such as sand and gravel mining or any other mineral mining.

b. For activities located within the watershed of any Oklahoma Scenic River, including the Illinois River, Flint Creek, Barren Fork Creek, Upper Mountain Fork, Little Lee Creek, and Lee Creek or any water or watershed designated "ORW" in Oklahoma's Water Quality Standards, certification is denied for any discharges originating from support activities, including, but not limited to, concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, or borrow areas.

c. Dewatering discharges into sediment or nutrient-impaired waters, and waters identified as Tier 2, Tier 2.5, or Tier 3 (OAC 785:46-13) shall be controlled to meet water quality standards for turbidity in those waters as follows:

i. Cool Water Aquatic Community/Trout Fisheries: 10 NTUs (OAC 785: 45-5-12(f)(7)(A)(i)

ii. Lakes: 25 NTUs (OAC 785: 45-5-12(f)(7)(A)(ii)

iii. In waters where background turbidity exceeds these values, turbidity from dewatering discharges should be restricted to not exceed ambient levels (OAC 785: 45-5-12(f)(7)(B)

9.7 EPA REGION 7

No additional conditions.

9.8 EPA REGION 8

9.8.1 MTR10I000 Indian country within the State of Montana

a. Blackfeet Nation.

i. The Applicant and applicants for projects authorized under the NWPs should obtain all other permits, licenses, and certifications that may be required by federal, state, or tribal authority. Primary relevant tribal permit will be ALPO (Ordinance 117). Others may apply. It is the applicant's responsibility to know the tribal and local ordinances and complete all necessary permissions before they can commence work.

ii. If a project is unable to meet the enclosed conditions, or if certification is denied for an applicable NWP, the Applicant may request an individual certification from Blackfeet. An individual certification request must follow the requirements outlined in 40 CFR 121.5 of EPA's CWA § 401 Certification Rule, effective September 11, 2020.

iii. Copies of this certification should be kept on the job site and readily available for reference.

iv. If the project is constructed and/or operated in a manner not consistent with the applicable NWP, general conditions, or regional conditions, the permittee may be in violation of this certification.

v. Blackfeet and EPA representatives may inspect the authorized activity and any mitigation areas to determine compliance with the terms and conditions of the NWP.

vi. This NWP Reissuance does not reduce Tribal authority under any other rule.

vii. The project, including any stream relocations and restoration, must be built as shown and as otherwise described in the application, the construction plans, cross sections, mitigation plans and other supporting documents submitted to this office. Impacts to aquatic systems and restoration efforts will be monitored by an appropriate aquatic resource professional to ensure that disturbed areas are restored to at least their original condition.

viii. All existing water uses will be fully maintained during and after the completion of the project. (If applicable)

ix. Where practicable, perform all in-channel and wetland work during periods of low flow or drawn—down or when dry

x. Equipment staging areas must be located out of all delineated wetlands

xi. Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during and immediately after construction, and all exposed soil and other fills, as well as any work below the ordinary high-water mark or in a wetland, must be permanently stabilized as soon as possible

xii. Materials such as piling, culverts, sandbags, fabric, mats, timbers used for temporary facilities in wetlands or below the high- water mark of Waters of the US must be free from oil, gas, excess dirt, loose paint and other pollutants.

xiii. Equipment staging areas in wetlands or in stream or river channels must be placed on mats, or other measures must be taken to minimize soil disturbance and compaction.

xiv. Clearing of riparian or wetland vegetation for the sole purpose of constructing work bridges, detours, staging areas or other temporary facilities must be limited to the absolute minimum necessary. When temporary impacts to native riparian or wetland vegetation are unavoidable, it must be mowed or cut above ground with the topsoil and root mass left intact.

xv. Remove all temporary fills and structures in the entirety when they are no longer needed. Restore affected areas to the appropriate original and planned contours where possible. Re-vegetate disturbed areas with appropriate native species when native species are impacted.

xvi. Construction methods and best management practices (BMPs) must minimize aquatic resource impacts to the maximum extent possible. Any BMPs described in the Joint Application must be followed. BMPs should include installation and maintenance of sediment control measures; separation, storage and reuse of any topsoil; and recovery of all disturbed areas where possible. All best management practices must in place prior to the onset of construction or as soon as practicable during the construction process.

xvii. Best available technology and/or best management practices must be utilized to protect existing water uses and maintain turbidity and sedimentation at the lowest practical level.

xviii. Applicant/contractor should manage disturbed streambank topsoil in a manner that optimizes plant establishment for the site.

xix. When operating equipment or otherwise undertaking construction in wetlands and water bodies the following conditions apply:

(k) Work should be done in dry conditions if possible.

(l) All equipment is to be inspected for oil, gas, diesel, anti-freeze, hydraulic fluid or other petroleum leaks. All such leaks will be properly repaired and equipment cleaned prior to being allowed on the project site. Leaks that occur after the equipment is moved to the project site will be fixed the same day or the next day or removed from the project area. The equipment is not allowed to continue operation once a leak is discovered.

(m) All equipment is to be inspected and cleaned before and after use to minimize the spread or introduction of invasive or undesirable species.

(n) Construction equipment shall not operate below the existing water surface except as follows:

- Impacts from construction should be minimized through the use of best management practices submitted in the permit application.
- Essential work below the waterline shall be done in a manner to minimize impacts to aquatic system and water quality.

(o) Containment booms and/or absorbent material must be available onsite. Any spills of petroleum products must be reported to the Army Corps, Blackfeet Nation BEO Office and the US EPA within 24 hours.

xx. Upland, riparian and in-stream vegetation should be protected except where its removal is necessary for completion of work. Revegetation should be completed as soon as possible. Applicant/contractor should revegetate disturbed soil in a manner that optimizes plant establishment for the site. Revegetation must include topsoil replacement, planting, seeding, fertilization, liming and weed-free mulching as necessary. Applicant must use native plant material and soils where appropriate and feasible. This certification does not allow for the introduction of non-native flora and fauna. All disturbed surface areas must be restored to pre-construction contours and elevation.

xxi. Spoils piles should not be placed or stored within the delineated wetlands or streams unless protected by a temporary structure designed to divert and handle high flows that can be anticipated during permit activity. Spoils piles should be placed on landscaping fabric or some other material to separate spoils material and allow retrieval of spoils material with minimal impact.

xxii. Impacts to wetlands shall not exceed 4.92 acres.

xxiii. Any unexpected and additional impacts to waters of the US should be reported to the

xxiv. Army Corps, Blackfeet Environmental Office Water Quality Coordinator and the US EPA.

xxv. All instream and stream channel reconstruction work must be completed before the stream is diverted into the new channel.

xxvi. Any temporary crossings, bridge supports, cofferdams, or other structures that are necessary during permit activity should be designed to handle high flows that can be anticipated during permit activity. All temporary structures should be completely removed from the water body at the conclusion of the permitted activity and the area restored to a natural function and appearance.

xxvii. The certification does not authorize any unconfined discharge of liquid cement into the waters of the United States. Grouting riprap must occur under dry conditions with no exposure of wet concrete to the water body.

xxviii. BMPs shall include application of certified weed-free straw or hay across all disturbed wetland areas that are temporarily impacted; installation and maintenance of sediment control measures during construction and if necessary, after construction is completed; use of heavy mud mats if necessary; separation,

storage and reuse of all streambank topsoil and wetland topsoil, as appropriate; and recovery of all disturbed wetland and streambank areas where possible. All conditions set by the Blackfeet Tribe and US Army Corps must be followed.

xxix. All applicants, including federal agencies, must notify EPA and the Blackfeet Environmental Office of the use of all NWPs for which certification has been granted prior to commencing work on the project. Notifications must include:

(p) project location (lat. Long., exact point on map);

(q) NWP that will be used and the specific activity that will be authorized under the NWP;

(r) amount of permanent and temporary fills;

(s) a short summary of the proposed activity, and all other federal, state, tribal or local permits or licenses required for the project;

(t) complete contact information of both the applicant and contractor (name, name of the company or property if applicable, telephone, mobile, and email); and,

(u) Summary of best management practices that will be used.

(v) A summary of communications with the affected Tribe's water quality staff regarding the project, including any concerns or issues.

(w) Notify Blackfeet and EPA at least 7 days before the completion of construction and operations begin.

xxx. Point source discharges may not occur: (1) in fens, bogs or other peatlands; (2) within 100 feet of the point of discharge of a known natural spring source; or (3) hanging gardens.

xxxi. Except as specified in the application, no debris, silt, sand, cement, concrete, oil or petroleum, organic material, or other construction related materials or wastes shall be allowed to enter into or be stored where it may enter into waters of the U.S.

xxxii. Silt fences, straw wattles, and other techniques shall be employed as appropriate to protect waters of the U.S. from sedimentation and other pollutants.

xxxiii. Water used in dust suppression shall not contain contaminants that could violate water quality standards.

xxxiv. Erosion control matting that is either biodegradable blankets or loose-weave mesh must be used to the maximum extent practicable.

xxxv. All equipment used in waters of the U.S. must be inspected for fluid leaks and invasive species prior to use on a project. All fluid leaks shall be repaired and cleaned prior to use or when discovered, or if the fluid leak can't be repaired, the equipment shall not be used on site. Equipment used in waters with the possibility of aquatic nuisance species infestation must be thoroughly cleaned and effectively decontaminated before they are used on the project.

xxxvi. Vegetation should be protected except where its removal is necessary for completion of the work. Locations disturbed by construction activities should be revegetated with appropriate native vegetation in a manner that optimizes plant establishment for the specific site.

xxxvii. Revegetation may include topsoil replacement, planting, seeding, fertilization, liming, and weed-free mulching, as necessary. Where practical, stockpile weed- seed-free topsoil and replace it on disturbed areas. All revegetation materials, including plants and plant seed shall be on site or scheduled for delivery prior to or upon completion of the earth moving activities.

xxxviii. Activities may not result in any unconfined discharge of liquid cement into waters of the U.S. Grouting riprap must occur under dry conditions with no exposure of wet concrete to the waterbody.

xxxix. Activities that may result in a point source discharge shall occur during seasonal low flow or no flow periods to the extent practicable.

xl. The placement of material (discharge) for the construction of new dams is not certified, except for stream restoration projects.

xli. Any decision-maker that is required under 7.0 of the CGP to prepare a Stormwater Pollution Prevention Plan (SWPPP), must submit an electronic copy of the SWPPP to the Blackfeet Environmental Office at least 30 days before construction starts for review and approval. Any modifications to the SWPPP should be submitted to the Blackfeet Environmental Office.

xlii. Any Decision-maker required under Part 1.4 of the CGP to submit a Notice of Intent (NOI) to EPA for coverage under the CGP, must submit a copy of the NOI to the Blackfeet Environmental Office within three business days of submittal to EPA. Additionally, a copy of the Notice of Termination (NOT) must be provided within three business days after electronic confirmation is received from EPA that the NOT has been accepted. The NOI and NOT must be provided to the following address Gerald Wagner, Blackfeet Environmental Office Director.

62 Hospital Drive, Browning, MT 59417

beo.director@gmail.com

b. Fort Peck Tribes.

i. Any Decision-maker required under Part 1.4 of the CGP to submit a Notice of Intent (NOI) to EPA for coverage under the CGP, must submit a copy of the NOI to the Fort Peck Tribes Office of Environmental Protection within three business days of submittal to EPA. Additionally, a copy of the Notice of Termination (NOT) must be provided within three business days after electronic confirmation is received from EPA that the NOT has been accepted. The NOI and NOT must be provided to the following address:

Martina Wilson, Office of Environmental Protection Director

501 Medicine Bear Rd Poplar, MT 59255

martinawilson@fortpecktribes.net

ii. Any Decision-maker that is required under Part 7.0 of the CGP to prepare a Stormwater Pollution Prevention Plan (SWPPP), must submit an electronic copy of the SWPPP to the Fort Peck Tribes Office of Environmental Protection at least 30 days before construction starts for review and approval. Any modifications to the

SWPPP should be submitted to the Fort Peck Tribes Office of Environmental Protection.

iii. Any Decision-maker that is required under Part 8.0 of the CGP to submit a weekly, bi-weekly, and/or annual report to EPA, must submit an electronic copy of the annual report to the Fort Peck Tribes Office of Environmental Protection within three business days after submittal to EPA.

9.9 EPA REGION 9

9.9.1 CAR10I000 Indian country within the State of California

a. Morongo Band of Mission Indians

i. A copy of the Stormwater Pollution Prevention Plan (SWPPP) must be submitted (either mailed or electronically) to the MEPD no less than thirty (30) days before commencing construction activities:

Morongo Band of Mission Indians
Environmental Protection Department
12700 Pumarra Road
Banning, CA 92220
Email: epd@morongo-nsn.gov

ii. Copies of the Notice of Intent (NOI) and the Notice of Termination (NOT) must be sent to the MEPD at the same time they are submitted to EPA.

iii. Operators of an "emergency-related project" must submit notice to the MEPD within twenty- four (24) hours after commencing construction activities.

iv. Spills, leaks, or unpermitted discharges must be reported to the MEPD within twenty-four (24) hours of the incident, in addition to the reporting requirements of the CGP.

v. Projects utilizing cationic treatment chemicals (as defined in Appendix A of the CGP) within the Morongo Reservation are not eligible for coverage under this certification of the CGP.

vi. Facilities covered under the CGP will be subject to compliance inspections by MEPD staff, including compliance with final site stabilization criteria prior to submitting an NOI ***[EPA assumes this intended to refer to an NOT]***.

9.9.2 GUR100000 Island of Guam

a. For purposes of this Order, the term "Project Proponent" shall mean U.S. Environmental Protection Agency, and its agents, assignees, and contractors.

b. For purposes of this Order, the permit "Operator" shall mean any party associated with a construction project that meets either of the following two criteria:

i. The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications (e.g. in most cases this is the owner of the site); or

ii. The party has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the permit; in most cases this is the general contractor of the project).

Subcontractors generally are not considered operators for the purposes of this permit.

c. The Project Proponent shall enforce the proposed 2022 CGP and ensure that the Operator complies with the conditions of the permit at all times.[108] (40 CFR §121.11(c))

d. All submittals required by this Order shall be sent to the Guam Environmental Protection Agency Attn: 401 Federal Permit Manager, Non-Point Source Program, EMAS Division, 3304 Mariner Avenue, Bldg. 17-3304, Barrigada, Guam 96913, AND via email to jesse.cruz@epa.guam.gov. The submittals shall be identified with WQC Order #2021- 04 and include the COP Permit Number, certifying representative's name, title, mailing address and phone number. (§51060)(4) 2017 GWQS)

e. A copy of the Operator's signed Stormwater Pollution Prevention Plan (SWPPP) and signed Notice of Intent (NOI) and Notice of Termination (NOT) submitted to EPA for review and approval, shall concurrently be submitted to Guam EPA, consistent with condition A4. Coordination with Guam EPA is encouraged when the receiving water(s) for the proposed discharge is/are being identified. (§10105.B.5.d.) GSESCR; (§51060)(4) 2017 GWQS)

f. The Operator must comply with the conditions and requirements set forth in 22 GAR 10, Guam Soil Erosion and Sediment Control Regulations (GSESCR).

g. Before submitting the NOT to EPA, Operators shall comply with GSESC regulations at §10105.B10. (Stabilization of Affected Areas) and §10107.B. {Final Inspection and Approval)

h. All operators/owners shall comply with the general design criteria for best management practices (BMPs) acceptable for meeting the Construction and Post-construction stormwater criteria in the 2006 CNMI and Guam Stormwater Management Manual. (E.O. 2012-02)

i. Operating reports and monitoring and analytical data (e.g. Discharge Monitoring Reports (DMRs), follow-up monitoring reports, Exceedance Reports for Numerical Effluent Limits, etc.) submitted to EPA shall be concurrently submitted to Guam EPA, consistent with condition A4. §51060)(4) 2017 GWQS

j. The Operators who install a sediment basin or similar impoundment shall maintain the storage capacity of five thousand cubic feet {5,000 cu. ft.) per acre of project area tributary to the basin. (§10105.B.5.i.) GSESCR

k. (1) This Order does not authorize EPA to qualify Rainfall Erosivity Waivers to stormwater discharges associated with small construction activities (i.e. 1-5 acres). Operators are required to apply for an NOI for those projects eligible for coverage under the proposed 2022 CGP. An Erosion and Sediment Control Plan is required for every site that would be covered by the proposed 2022 CGP. (22 GAR §10104) The average annual rainfall for Guam and the CNMI exceeds I00 inches per year in many locations. These climatic conditions combined with the region's unique limestone, volcanic geologic formations, sensitive water resources and significant land

[108] By incorporating this condition into the permit, EPA acknowledges receipt of Guam's certification conditions.

development forces make stormwater discharges a very significant environmental and economic issue. (2006 CNMJ/Guam Stormwater Management Manual) E.O. 2012-02

(2) This Order does not authorize EPA to approve a Sediment TMDL Waiver for the Ugum River. Operators of construction activities eligible for a TMDL Waiver in lieu of coverage under the proposed 2022 CGP, shall submit a complete and accurate waiver certification as described in C.2., Appendix C - (Small Construction Waivers) to Guam EPA per condition A4., prior to notifying EPA of its intention to obtain a waiver. §51060)(4) 2017 GWQS

l. The Project Proponent shall submit to Guam EPA a signed Statement of Understanding of Water Quality Certification Conditions.[109] (see Attachment A for an example) per condition A4. §51060)(4) 2017 GWQS

m. The Operator shall comply with applicable provisions of the Guam Pesticides Act of2007 (10 GCA Chapter 50) and implementing regulations at Title 22 GAR Chapter 15 for any use and application of pesticides.

n. Point source discharge(s) to waterbodies under the jurisdiction of Guam EPA must be consistent with the antidegradation policy in 22 GAR §510l(b).

o. The operator shall carry out construction activities in such a manner that will not violate Guam Water Quality Standards (GWQS). Proposed 2022 CGP discharges are prohibited as follows:

- **i.** In Marine Waters, Category M-1 Excellent 22 GAR Chapter 5 §5102(b)(I); and
- **ii.** In Surface Waters, Category S-1 High 22 GAR Chapter 5 §5102(c)(I)

p. In addition to complying with construction dewatering requirements in Part 2.4 and site inspection requirements for all areas where construction dewatering is taking place in Part 4 of the proposed 2022 CGP, Operators shall comply with all dewatering conditions and requirements set forth in 22 GAR 7, Water Resources Development and Operating Regulations, to include securing Guam EPA permits prior to any dewatering activities.

q. The Operator shall develop and implement a Spill Prevention and Containment Plan.

r. The Operator shall have adequate and appropriate spill response materials on hand to respond to emergency release of oil, petroleum or any other material into waters of the territory.

s. Any unpermitted discharge into territorial waters or onto land with a potential for entry into territorial waters, is prohibited. If this occurs, the Operator shall immediately take the following actions:

- **i.** Cease operations at the location of the violation or spill.
- **ii.** Assess the cause of the water quality problem and take appropriate measures to correct the problem and/or prevent further environmental damage.
- **iii.** Notify Guam EPA of the failure to comply. All petroleum spills shall be reported immediately to:

[109] By incorporating this condition into the permit, EPA acknowledges receipt of Guam's certification conditions.

(x) Guam's Emergency 911 system

(y) Guam EPA's 24-Hour Spill Response Team at (671) 888-6488 or during working hours (671) 300-4751

(z) US Coast Guard Sector Guam (671) 355-4824

(aa) National Response Center 1-800-424-8802

iv. Submit a detailed written report to Guam EPA within five days of noncompliance that describes the nature of the event corrective action taken and/or planned, steps to be taken to prevent a recurrence, results of any samples taken, and any other pertinent information.

t. Compliance with this condition does not relieve the Operator from responsibility to maintain continuous compliance with the terms and conditions of this Order or the resulting liability from failure to comply.

u. Submittal or reporting of any of this information does not provide relief from any subsequent enforcement actions for unpermitted discharges to waters of the United States.

v. This Order is valid for five (5) Years from Date of Certification, unless otherwise approved by the Guam EPA Administrator.

w. The Operator shall be required to adhere to the current Guam Coral Spawning Moratorium dates for both hard and soft corals where in-water activities and/or construction activity in close proximity with marine waters may impair water quality. These dates can be obtained from the Guam Department of Agriculture, Division of Aquatic and Wildlife Resources, or the NOAA NMFS Pacific Islands Regional Office Habitat Conservation Division.

x. The Operator shall provide notice to Guam EPA consistent with Condition A4:

(a) Immediately upon discovery of noncompliance with the provisions of this Order.

y. A Notice of Violation/Work Stop Order will be issued if certification conditions are not adhered to or when significant or sustained water quality degradation occurs. Work or discharge shall be suspended or halted until the Operator addresses environmental problems/concerns to Guam EPA's satisfaction. Guam EPA may also levy penalties and fines (10 GCA §47111). Invalidity or enforceability of one or more provisions of this certification shall not affect any other provision of this certification.

9.10 EPA REGION 10

9.10.1 IDR10I000 Indian country within the State of Idaho, except Duck Valley Reservation lands (see Region 9)

a. Shoshone-Bannock Tribes

i. Copies of the following information must be sent to the SBT-WRD:

(a) Notice of Intents (NOI)

The Notice of Intent shall be forwarded to the SBT-WRD within thirty (30) days of receipt of submitting NOI to the USEPA.

Shoshone-Bannock Tribes Water Resources Department
PO Box 306 Pima Drive
Fort Hall, ID 83203 Phone: (208) 239-4582
Fax: (208) 239-4592
Or Email ctanaka@sbtribes.com

ii. If requested by the SBT-WRD, the permittee must submit a copy of the SWPPP to SBT- WRD within fourteen (14) days of the request.

9.10.2 ORR10I000 Indian country within the State of Oregon, except Fort McDermitt Reservation lands (see Region 9)

a. Confederated Tribes of Coos, Lower Umpqua, and Siuslaw

i. No activities allowed under the CGP shall result in the degradation of any Tribal waters or affect resident aquatic communities or resident or migratory wildlife species at any life stage.

ii. The operator shall be responsible for achieving compliance with CTCLUSI Water Quality Standards and all other tribal codes, regulations, and laws as they exist at the time that the permit is submitted.

iii. The operator shall submit a copy of the Notice of Intent (NOI) to be covered by the general permit to the CTCLUSI Water Quality Program before, or at the same time as, it is submitted to EPA.

iv. The operator shall be responsible for submitting all Stormwater Pollution Prevention Plans (SWPPP) required under this general permit to the CTCLUSI Water Quality Program for review and determination that the SWPPP is sufficient to meet Tribal Water Quality Standards, prior to the beginning of any discharge activities taking place.

v. The operator shall be responsible for reporting an exceedance to Tribal Water Quality Standards to the CTCLUSI Water Quality Program at the same time it is reported to EPA.

vi. The THPO will be provided 30 days to comment on the APE as defined in the permit application.

vii. If the project is an undertaking, a cultural resource assessment must occur. All fieldwork must be permitted by the THPO (as appropriate), conducted by qualified personnel (as outlined by the Secretary of Interior's Standards and Guidelines; http://www.nps.gov/history/local-law/arch_stnds_O.htm) and documented according to Oregon Reporting Standards (Reporting_Guidelines.pdf) (oregon.gov). The resulting report must be submitted to the THPO and the THPO must concur with the finding of effect and recommendations before any ground disturbing work can occur. The THPO requires 30 days to review all reports.

viii. The operator must obtain THPO concurrence in writing. If historic properties are present, this written concurrence will outline measures to be taken to prevent or mitigate adverse effects to historic properties.

b. Confederated Tribes of the Umatilla Indian Reservation

i. The operator shall be responsible for achieving compliance with the Confederated Tribes of the Umatilla Indian Reservation's (CTUIR) Water Quality

Standards.

ii. The operator shall submit a copy of the Notice of Intent (NOI) to be covered by the general permit to the CTUIR Water Resources Program at the address below, at the same time it is submitted to EPA.

iii. The operator shall be responsible for submitting all Stormwater Pollution Prevention Plans (SWPPP) required under this general permit to the CTUIR Water Resources Program for review and determination that the SWPPP is sufficient to meet Tribal Water Quality Standards, prior to the beginning of any discharge activities taking place.

iv. The operator shall be responsible for reporting an exceedance to Tribal Water QualityStandards to the CTUIR Water Resources Program at the same time it is reported to EPA.

Confederated Tribes of the Umatilla Indian Reservation
Water Resources Program
46411 Timíne Way
Pendleton, OR 97801
(541) 429-7200

v. The THPO will be provided 30 days to comment on the APE as defined in the permit application.

vi. If the project is an undertaking, a cultural resource assessment must occur. All fieldwork must be permitted by the Tribal Historic Preservation Office (as appropriate), conducted by qualified personnel (as outlined by the Secretary of Interior's Standards and Guidelines; http://www.nps.gov/history/local-law/arch_stnds_0.htm) and documented according to Oregon Reporting Standards (Reporting_Guidelines.pdf (oregon.gov). The resulting report must be submitted to the THPO and the THPO must concur with the finding of effect and recommendations before any ground disturbing work can occur. The THPO requires 30 days to review all reports.

vii. The operator must obtain THPO concurrence in writing. If historic properties are present, this written concurrence will outline measures to be taken to prevent or mitigate adverse effects to historic properties.

9.10.3 WAR10F000 Areas in the State of Washington, except those located on Indian country, subject to construction activity by a Federal Operator

a. For purposes of this Order, the term "Project Proponent" shall mean those that are seeking coverage under this permit, and its agents, assignees and contractors.

b. The Federal Agency shall mean the US Environmental Protection Agency. The Federal Agency shall enforce the permit and ensure that the Project Proponent complies with the conditions of the permits at all times.

c. Failure of any person or entity to comply with this Certification may result in the issuance of civil penalties or other actions, whether administrative or judicial, to enforce the terms of this Certification.

d. The Certification conditions within this Order must be incorporated into EPA's final NPDES permit. Per 40 CFR 121.10(a), all certification conditions herein that satisfy the requirements of 40 CFR 121.7(d) must be incorporated into the permit. Per 40 CFR

121.10(b), the permit must clearly identify all certification conditions.

e. This Certification does not authorize exceedances of water quality standards established in chapter 173-201A WAC.

f. Discharges from construction activity must not cause or contribute to violations of the Water Quality Standards for Surface Water of the State of Washington (chapter 173-201A WAC), Ground Water Quality Standards (chapter 173- 200 WAC), Sediment Management Standards (chapter 173-204 WAC), and standards in the EPA's Revision of certain Federal water quality criteria applicable to Washington (40 CFR 131.45). Discharges that do not comply with these standards are prohibited.

g. Prior to discharge of stormwater and non-stormwater to waters of the State, the Permittee must apply all known, available, and reasonable methods of prevention, control, and treatment (AKART). This includes the preparation and implementation of an adequate Stormwater Pollution Prevention Plan (SWPPP), with all appropriate Best Management Practices (BMPs) installed and maintained in accordance with the SWPPP and the terms and conditions of the permit.

i. BMPs must be consistent with:

(a) The Stormwater Management Manual for Western Washington (most current approved edition at the time this permit was issued), for sites west of the crest of the Cascade Mountains; or

(b) The Stormwater Management Manual for Eastern Washington (most current approved edition at the time this permit was issued), for sites east of the crest of the Cascade Mountains; or

(c) Revisions to either manual, or other stormwater management guidance documents or manuals which provide equivalent level of pollution prevention, that are approved by Ecology and incorporated into this permit in accordance with the permit modification requirements of WAC 173-226-230. (For purposes of this section, the stormwater manuals listed in Appendix 10 of the Phase I Municipal Stormwater Permit are approved by Ecology); or

(d) Documentation in the SWPPP that the BMPs selected provided an equivalent level of pollution prevention, compared to the applicable stormwater management manuals, including:

- The technical basis for the selection of all stormwater BMPs (scientific, technical studies, and/or modeling) that support the performance claims for the BMPs being selected.
- An assessment of how the selected BMP will satisfy AKART requirements and the applicable federal technology-based treatment requirements under 40 CFR part 125.3.

The Stormwater Management Manuals for Eastern and Western Washington can be found at: https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Stormwater-permittee-guidance-resources/Stormwater-manuals.

ii. An adequate SWPPP must include a narrative and drawings. All BMPs must be clearly referenced in the narrative and marked on the drawings. The SWPPP narrative must include documentation to explain and justify the pollution

prevention decisions made for the project. Documentation must include:

(a) Information about existing site conditions (topography, drainage, soils, vegetation, etc.).

(b) Potential erosion problem areas.

(c) The 13 elements of a SWPPP, including BMPs used to address each element. Unless site conditions render the element unnecessary and the exemption is clearly justified in the SWPPP, the 13 elements are as follows:

- Preserve Vegetation/Mark Clearing Limits
- Establish Construction Access
- Control Flow Rates
- Install Sediment Controls
- Stabilize Soils
- Protect Slopes
- Protect Drain Inlets
- Stabilize Channels and Outlets
- Control Pollutants
- Control Dewatering
- Maintain BMPs
- Manage the Project
- Protect Low Impact Development (LID) BMPs

h. Discharges of stormwater and authorized non-stormwater must be monitored for turbidity (or transparency) and, in the event of significant concrete work or engineered soils, pH must also be monitored. As applicable based on project specifics, monitoring, benchmarks, and reporting requirements contained in Condition S.4. (pp.10-16) of the Washington State Construction Stormwater General Permit, effective January 1, 2021, shall apply.

i. Discharges to segments of waterbodies listed as impaired by the State of Washington under Section 303(d) of the Clean Water Act for turbidity, fine sediment, phosphorus, or pH must comply with the following numeric effluent limits:

Parameter identified in 303(d) listing	Parameter Sampled	Unit	Analytical Method	Numeric Effluent Limit
• Turbidity • Fine Sediment • Phosphorus	Turbidity	NTU	SM2130	25 NTUs at the point where the stormwater is discharged from the site.
High pH	pH	su	pH meter	In the range of 6.5 – 8.5

All references and requirements associated with Section 303(d) of the Clean Water Act mean the most current EPA-approved listing of impaired waters that exists on the

effective date of the permit, or the date when the operator's complete permit application is received by EPA, whichever is later.

The EPA approved WQ Assessment can be found at: https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-improvement/Assessment-of-state-waters-303d

j. Discharges to a waterbody that is subject to a Total Maximum Daily Load (TMDL) for turbidity, fine sediment, high pH, or phosphorus must be consistent with the TMDL.

i. Where an applicable TMDL sets specific waste load allocations or requirements for discharges covered by this permit, discharges shall be consistent with any specific waste load allocations or requirements established by the applicable TMDL.

ii. Where an applicable TMDL has established a general waste load allocation for construction stormwater discharges, but no specific requirements have been identified, compliance with this permit will be assumed to be consistent with the approved TMDL.

iii. Where an applicable TMDL has not specified a waste load allocation for construction stormwater discharges, but has not excluded these discharges, compliance with this permit will be assumed to be consistent with the approved TMDL.

iv. Where an applicable TMDL specifically precludes or prohibits discharges from construction activity, the operator is not eligible for coverage under this permit.

Applicable TMDL means a TMDL for turbidity, fine sediment, high pH, or phosphorus which has been completed and approved by EPA as of the effective date of the permit, or prior to the date of the operator's complete application for permit coverage is received by EPA, whichever is later.

k. Discharges to waters of the state from the following activities are prohibited:

i. Concrete wastewater.

ii. Wastewater from washout and clean-up of stucco, paint, form release oils, curing compounds and other construction materials.

iii. Process wastewater as defined by 40 Code of Federal Regulations (CFR) 122.2.

iv. Slurry materials and waste from shaft drilling, including process wastewater from shaft drilling for construction of building, road, and bridge foundations unless managed to prevent discharge to surface water.

v. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance.

vi. Soaps or solvents used in vehicle and equipment washing.

vii. Wheel wash wastewater, unless managed to prevent discharge to surface water.

viii. Discharges from dewatering activities, including discharges from dewatering of trenches and excavations, unless managed according to appropriate controls described within the permit.

l. This Certification is valid until the expiration date including any administrative extension or termination date of the NPDES 2022 Construction General Permit. (40 CFR § 122.46)

m. The Federal Agency shall enforce and the Project Proponent must comply with all the reporting and notification conditions of the NPDES 2022 Construction General Permit in order to comply with this Order and the certification conditions herein (40 CFR § 121.11).

n. You have a right to appeal this Order to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this Order. The appeal process is governed by chapter 43.21B RCW and chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do all of the following within 30 days of the date of receipt of this Order:

- File your appeal and a copy of this Order with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this Order on Ecology in paper form - by mail or in person (see addresses below). E-mail is not accepted.

You must also comply with other applicable requirements in chapter 43.21B RCW and chapter 371-08 WAC.

ADDRESS AND LOCATION INFORMATION

Street Addresses	Mailing Addresses
Department of Ecology Attn: Appeals Processing Desk 300 Desmond Drive SE Lacey, WA 98503 **Pollution Control Hearings Board** 1111 Israel RD SW STE 301 Tumwater, WA 98501	**Department of Ecology** Attn: Appeals Processing Desk PO Box 47608 Olympia, WA 98504-7608 **Pollution Control Hearings Board** PO Box 40903 Olympia, WA 98504-0903

CONTACT INFORMATION

Please direct all questions about this Order to:

Noel Tamboer
Department of Ecology
P.O. Box 47600
Olympia, WA 98503-7600

(360) 701-6171
noel.tamboer@ecy.wa.gov

9.10.4 WAR10I000 Indian country within the State of Washington

a. Lummi Nation

i. This certification does not exempt and is provisional upon compliance with other applicable statutes and codes administered by federal and Lummi tribal agencies. Pursuant to Lummi Code of Laws (LCL) 17.05.020(a), the operator must also obtaina land use permit from the Lummi Planning Department as provided in Title 15 of theLummi Code of Laws and regulations adopted thereunder.

ii. Pursuant to LCL 17.05.020(a), each operator shall develop and submit a Storm WaterPollution Prevention Plan to the Lummi Water Resources Division for review and approval by the Water Resources Manager prior to beginning any discharge activities.

iii. Pursuant to LCL Title 17, each operator shall be responsible for achieving compliance with the Water Quality Standards for Surface Waters of the Lummi

iv. Indian Reservation (Lummi Administrative Regulations [LAR] 17 LAR 07.010 through 17 LAR 07.210 together with supplements and amendments thereto).

v. Each operator shall submit a signed copy of the Notice of Intent (NOI) to the Lummi Water Resources Division at the same time it is submitted electronically to the Environmental Protection Agency (EPA) and shall provide the Lummi Water Resources Division the acknowledgement of receipt of the NOI from the EPA and the associated NPDES tracking number provided by the EPA within 7 calendar days of receipt from the EPA.

vi. Each operator shall submit a signed copy of the Notice of Termination (NOT) to the Lummi Water Resources Division at the same time it is submitted electronically to the EPA and shall provide the Lummi Water Resources Division the EPA acknowledgement of receipt of the NOT.

vii. Storm Water Pollution Prevention Plans, Notice of Intent, Notice of Termination and associated correspondence with the EPA shall be submitted to:

Lummi Natural Resources Department
ATTN: Water Resources Manager 2665 Kwina Road
Bellingham, WA 98226-9298

b. Port Gamble S'Klallam Tribe

i. No discharge from the project site shall cause exceedances of Port Gamble S'KlallamSurface Water Quality Standards narrative or numeric criteria in Tribal waters. This includes activities outside of Tribal lands that occur upstream of Tribal waters.

(a) If any exceedance of these water quality standards occurred, the Natural Resources Department shall be notified immediately.

- The Department shall additionally be provided a complete draft of the proposed corrective action within a reasonable timeframe and its approval will be required before any corrective action may be taken.

ii. Operators performing activities under the CGP that may affect Tribal waters will requirea permit and shall submit their plans to the Port Gamble S'Klallam Natural Resources Department for review.

- The Department has the right to require conditions outside of this Water QualityCertification prior to permit approval.

iii. No activities allowed under the CGP shall result in the degradation of any Tribal

watersor change in designated uses.

iv. No activities allowed under the CGP shall affect resident aquatic communities or resident/migratory wildlife species at any life stage.
- Biological assessment methods used to determine the effect of an activity allowedunder the CGP shall be approved by the PGST Natural Resources Department.

v. No activities allowed under the CGP shall be conducted within wetland and stream bufferzones, nor shall said activities affect in any way wetland or stream buffers, as defined by *PGST Law and Order Code 24.08.01(c)*.

vi. Concentrations for substances listed within the table in *Water Quality Standards for Surface Waters* sec. 7(7) shall not be exceeded by activities allowed under the CGP.

c. Spokane Tribe of Indians

i. Pursuant to Tribal Law and Order Code (TLOC) Chapter 30 each operator shall be responsible for achieving compliance with the Surface Water Quality Standards of the Spokane Tribe. The operator shall notify the Spokane Tribe, Water Control Board (WCB) of any spills of hazardous material and;

ii. Each operator shall submit a signed hard copy of the Notice of Intent (NOI) to the WCB at the same time it is submitted to EPA.

iii. The permittee shall allow the Tribal Water Control Board or its designee to inspect and sample at the construction site as needed.

iv. Each operator shall submit a signed copy of the Notice of Termination (NOT) to the WCB at the same time it is submitted to EPA

The correspondence address for the Spokane Tribe Water Control Board is:

Water Control Board c/o Brian Crossley PO Box480
Wellpinit WA 99040
(509)626-4409
crossley@spokanetribe.com

d. Swinomish Tribe

i. Owners and operators seeking coverage under this permit must submit a copy of the Notice of Intent (NOI) to the DEP at the same time the NOI is submitted to EPA.

ii. Owners and operators must also submit to the DEP changes in NOI and/or Notices of Termination at the same time they are submitted to EPA.

iii. Owners and operators seeking coverage under this permit must also submit a Stormwater Pollution Prevention Plan to the DEP for review and approval by DEP prior to beginning any discharge activities.

e. Tulalip Tribes

i. Submission of NOI: Copies of the Notice of Intent (NOI),) Certification shall be submitted to the Tribe's Natural Resources Department to notify the Tribes of the pending project and in order for the Tribes to review the projects potential impacts to endangered or threatened species.

ii. Submission of SWPPP: A copy of the Stormwater Pollution Plans (SWPPPs) shall be submitted to the Tribe's Natural Resources Department along with the NOI during the 30 day waiting period.

iii. Submission of Monitoring Data and Reports: The results of any monitoring required by this permit and reports must be sent to the Tribe's Natural Resources Depa1tment,

iv. The Tulalip Tribes are federally recognized successors in the interest to the Snohomish, Snoqualmie, Skykomish, and other allied tribes and bands signatory to the Treaty of Point Elliott.

v. including a description of the corrective actions required and undertaken to meet effluent limits or benchmarks (as applicable).

vi. Authorization to Inspect: The Tribe's Natural Resources Department may conduct an inspection of any facility covered by this permit to ensure compliance with tribal water quality standards. The Department may enforce its certification conditions.

vii. Submission of Inspection Reports: Inspection reports must be sent to the Tribe's Natural Resources Department, including a description of the corrective actions required and undertaken to meet effluent limits or benchmarks (as applicable).

viii. Permits on-site: A copy of the pe1mit shall be kept on the job site and readily available for reference by the construction supervisor, construction managers and foreman, and Tribal inspectors.

ix. Project Management: The applicant shall ensure that project managers, construction managers and foreman, and other responsible parties have read and understand conditions of the permit, this certification, and other relevant documents, to avoid violations or noncompliance with this certification.

x. Emergency Spill Notification Requirements: In the event of a spill or the contractor shall immediately take action to stop the violation and correct the problem, and immediately repo1t spill to the Tulalip Tribes Police Department (425) 508-1565. Compliance with this condition does not relieve the applicant from responsibility to maintain continuous compliance with the tem1S and conditions of this certification or the resulting liability from failure to comply.

xi. Discharges to CERCLA Sites: This permit does not autho1ize direct stormwater discharges to certain sites undergoing remedial cleanup actions pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) unless first approved by the appropriate EPA Regional office. In the case of the Tulalip Landfill site (WAD980639256), the Tulalip Tribes also requests notification by the facility and consultation with EPA prior to discharge. Contaminants at this site may include but are not limited to: dioxins, furans, arsenic, copper, lead, zinc, 4- methyl-phenol, Hex-CB, HPAHs, PCBs, PCE, cadmium, mercury, and LPAHs.

xii. Discharge-related Activities that have Potential to Cause an Adverse Effect on Historic Properties: Installation of stormwater controls that involve subsurface disturbances may potentially have an adverse impact on historic properties.

xiii. Procedures detailed in the permit shall be completed. Richard Young, of the Tulalip Tribe's Cultural Resources Department shall be contacted prior to initiating

discharge- related activities that may have an impact on historic properties. His contact information is (360) 716-2652, ryoung@tulaliptribes-nsn.gov.

xiv. Invalidation: This certification will cease to be valid if the project is constructed and/or operated in a manner not consistent with the project description contained in

xv. the permit. This certification will also cease to be valid and the applicant must reapply with an updated application if info1mation contained in the permit is voided by subsequent submittals.

xvi. Modification: Nothing in this certification waives the Tulalip Tribes of Washington's authority to issue modifications to this ce1iification if additional impacts due to operational changes are identified, or if additional conditions are necessary to protect water quality or further protect the Tribal Communities interest.

xvii. incorporation by reference: TI1is certification does not exempt the applicant from compliance with other statues and codes administered by the Tribes, county, state and federal agencies.

xviii. Compliance with Tribe's I996 Water Quality Standards: Each permittee shall be responsible for controlling discharges and achieving compliance with the T1ibe's Water Quality Standards.

xix. Compliant with Tulalip Tribes Tidelands Management Policy: Permittee shall be responsible for achieving compliance with applicable sections of the Tulalip Tribe's Tidelands Management Policy. (Tulalip Tribal Code Title 8 Chapter 8.30).

xx. Compliant with Tulalip Tribes Environmental Infractions: Permittee shall be responsible for achieving compliance with applicable sections of the Tulalip Tribe's Environmental Infractions. (Tulalip Tribal Code Title 8 Chapter 8.20).

xxi. Where to Submit information and for further Coordination: All requested documents should be sent to the: Tulalip Tribes Natural Resources Environmental Department c/o Kurt Nelson and Valerie Streeter, 6704 Marine Drive, Tulalip, Washington 98271. For further 40 I Certification coordination with the Tulalip Tribes Natural Resources Department, please contact Mr. Kurt Nelson (360) 716-4617 knelson@tu1aliptribes- nsn.gov. 6406 Marine Dr., Tulalip WA 98271.

f. Makah Tribe

i. The permittee shall be responsible for meeting any additional permit requirements imposed by EPA necessary to comply with the Makah Tribe's Water Quality Standards if the discharge point is located within the Makah's U&A treaty reserved areas.

ii. Each permittee shall submit a copy of the Notice of Intent (NOI) to be covered by the general permit to Makah Fisheries Management, Water Quality Department at the address listed below at the same time it is submitted to the EPA.

Makah Water Quality
Makah Fisheries Management (MFM)
ray.colby@makah.com
PO Box 115
Neah bay, WA 98357

iii. All supporting documentation and certifications in the NOI related to coverage under the general permit for Endangered Species Act purposes shall be submitted to the Tribe's Habitat programs for their review.

iv. If EPA requires coverage under an individual or alternative permit, the permittee shall submit a copy of the permit to Assistant Fisheries Director, ray.colby@makah.com.

v. The permittee shall submit all Stormwater Pollution Prevention plan (SWPP) to MFM for review and approval prior to beginning any activities resulting in a discharge to Makah tribal waters.

vi. The permittee shall notify Ray Colby, ray.colby@makah.com (360) 645-3150 prior to conducting inspections at construction sites generating stormwater discharges to tribal waters.

vii. The operator shall treat dewatering discharges with controls necessary to minimize discharges of pollutants to surface waters, or ground waters, and from stormwater runoff onsite from excavations, trenches, foundations, or storage areas. To the extent feasible, at all points where dewatering is discharged, comply with the velocity dissipation using check dams, sediment traps, and grouted outlets.

g. Puyallup Tribe of Indians

i. The permittee shall be responsible for meeting any additional permit requirements imposed by EPA necessary to comply with the Puyallup Tribe's antidegradation procedures.

ii. Each permittee shall submit a copy of the Notice of Intent (NOI) to be covered by the general permit to Char Naylor, Tribal Water Quality Manager at the following e-mail address: (char.naylor@puyalluptribe-nsn.gov) at the same time it is submitted to EPA.

iii. All supporting documentation and certifications in the NOI related to coverage under the general permit for Endangered Species Act purposes shall be submitted to Char Naylor, Tribal Water Quality Manager/Assistant Fisheries Director (char.naylor@puyalluptribe-nsn.gov) for review.

iv. If EPA requires coverage under an individual or alternative permit, the permittee shall submit a copy of the permit to Char Naylor at the email address listed above.

v. The permittee shall submit all stormwater pollution prevention plans to Char Naylor for review and approval prior to beginning any activities resulting in a discharge to Puyallup tribal waters.

vi. The permittee shall contact Brandon Reynon (Brandon.reynon@puyalluptribe-nsn-gov), Tribe's Historic Preservation Officer or Jennifer Keating (Jennifer.keating@puyalluptribe-nsn.gov), Tribe's Assistant Historic Preservation Officer regarding historic properties and cultural resources.

vii. To minimize the discharge of pollutants to groundwater or surface waters from stormwater that is removed from excavations, trenches, foundations, vaults, or other storage areas, treat dewatering discharges with controls necessary to minimize discharges of pollutants. Examples of appropriate controls include sediment basins or sediment traps, sediment socks, dewatering tanks, tube

settlers, weir tanks, and filtration systems (e.g., bag or sand filters) that are designed to remove sediment.

To the extent feasible, utilize vegetated, upland areas of the site to infiltrate dewatering water before discharge. At all points where dewatering water is discharged, utilize velocity dissipation controls. Examples of velocity dissipation devices include check dams, sediment traps, riprap, and grouted riprap at outlets.

viii. The permittee shall provide and maintain natural buffers to the maximum extent possible (and/or equivalent erosion and sediment controls) when tribal waters are located within 100 feet of the boundaries. If infeasible to provide and maintain an undisturbed 100 foot natural buffer, erosion and sediment controls to achieve the sediment load reduction equivalent to a 100-foot undisturbed natural buffer shall be required.

10 ADDITIONAL PERMIT CONDITIONS APPLICABLE TO LANDS OF EXCLUSIVE FEDERAL JURISDICTION

All projects that discharge to receiving waters located within Lands of Exclusive Federal Jurisdiction must comply with the provisions in this Part in addition to Parts 1, 2, and 3.2 thru 8 of this permit.[110] [111] [112]

10.1 INSPECTION FREQUENCIES

You must comply with the increased inspection frequencies specified in Part 4.3.1.

10.2 STABILIZATION DEADLINES

You must comply with the stabilization deadlines specified in Part 2.2.14b.iv.

10.3 TURBIDITY BENCHMARK MONITORING FOR DEWATERING DISCHARGES

You must comply with the benchmark monitoring requirements in Part 3.3 for sites discharging dewatering water.

10.4 ADDITIONAL WATER QUALITY-BASED LIMITATIONS FOR STORMWATER AND AUTHORIZED NON-STORMWATER DISCHARGES

Your discharge must not contain:

a. Observable deposits of floating solids, scum, sheen, or other substances;

b. An observable film, sheen, or discoloration from oil and grease; or

c. Foam or substances that produce an observable change in color, odor, or cloudiness in the discharge.

[110] The requirements of Part 9 do not apply to projects within Lands of Exclusive Federal Jurisdiction.

[111] This section does not apply to projects within Denali National Park and Preserve or projects that are eligible for coverage in Appendix B for federal facilities in Vermont, Delaware, and Colorado and for areas in Washington where construction activities are carried out by a Federal Operator.

[112] EPA notes that reference to water quality standards in Part 7.2.6(b)(vi)(c) for projects that discharge to receiving waters in Lands of Exclusive Federal Jurisdiction means the requirements of Part 10.4.a-c.

If any of these conditions are observed, except with respect to dewatering discharges, you must treat this as triggering corrective action under Part 5, which requires that you take corrective action and document the corrective actions as required in Part 5.2.[113]

For sites discharging from dewatering operations, you must implement corrective actions if any of the conditions described in Part 5.1.5 occur and comply with the requirements of Part 5.2.2 for responding to these conditions.

[113] Consistent with this requirement, with respect to projects discharging to receiving waters in Lands of Exclusive Federal Jurisdiction, the triggering condition in Part 5.1.3 relating to water quality standards means that one of the discharge conditions in this section (Part 10.4.a-c) has occurred.

Appendix A - Definitions and Acronyms

1. Definitions

"Action Area" – all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. See 50 CFR 402. For the purposes of this permit and for application of the threatened and endangered species protection eligibility requirements, the following areas are included in the definition of action area:

- The areas on the construction site where stormwater discharges originate and flow toward the point of discharge into the receiving waters. This includes:
    - areas on the construction site where excavation, site development, or other ground disturbance activities occur, and
    - areas where stormwater controls will be constructed and operated, including any areas where stormwater flows to and from the stormwater controls.
- The areas in the vicinity of the construction site where stormwater discharges flow from the construction site to one or more points of discharge into receiving waters. (Example: Where stormwater flows into an off-site ditch, swale, or gully that leads to receiving waters.
- The extent of the receiving water potentially affected by stormwater discharges from your construction site through alteration of water chemistry, turbidity, temperature, or bank structure (i.e., erosive flow), regardless of whether the construction site is adjacent to the receiving water.

"Agricultural Land" - cropland, grassland, rangeland, pasture, and other agricultural land, on which agricultural and forest-related products or livestock are produced and resource concerns may be addressed. Agricultural lands include cropped woodland, marshes, incidental areas included in the agricultural operation, and other types of agricultural land used for the production of livestock.

"Antidegradation Policy" or "Antidegradation Requirements" - the water quality standards regulation that requires States and Tribes to establish a three-tiered antidegradation program:

1. Tier 1 maintains and protects existing uses and water quality conditions necessary to support such uses. An existing use can be established by demonstrating that fishing, swimming, or other uses have actually occurred since November 28, 1975, or that the water quality is suitable to allow such uses to occur. Where an existing use is established, it must be protected even if it is not listed in the water quality standards as a designated use. Tier 1 requirements are applicable to all surface waters.
2. Tier 2 maintains and protects "high quality" waters -- waterbodies where existing conditions are better than necessary to support CWA § 101(a)(2) "fishable/swimmable" uses. Water quality can be lowered in such waters. However, State and Tribal Tier 2 programs identify procedures that must be followed and questions that must be answered before a reduction in water quality can be allowed. In no case may water quality be lowered to a level which would interfere with existing or designated uses.
3. Tier 3 maintains and protects water quality in outstanding national resource waters (ONRWs). Except for certain temporary changes, water quality cannot be lowered in such waters. ONRWs generally include the highest quality waters of the United States. However, the ONRW classification also offers special protection for waters of exceptional ecological significance, i.e., those which are important, unique, or sensitive ecologically.

Decisions regarding which water bodies qualify to be ONRWs are made by States and authorized Indian Tribes.

"Arid Areas" – areas with an average annual rainfall of 0 to 10 inches. For assistance in determining average annual rainfall in specific locations, refer to the NOAA National Mapping webpage (https://www.ncdc.noaa.gov/cag/national/mapping), the PRISM Climate Group's Time Series Values for individual locations (https://prism.oregonstate.edu/explorer/), or EPA's US EPA EnviroAtlas (https://www.epa.gov/enviroatlas).

"Bank" (e.g., stream bank or river bank) – the rising ground bordering the channel of a water of the U.S.

"Biodegradable" – capable of decomposing under ambient soil conditions into naturally occurring materials over a period of time (e.g., one year).

"Bluff" – a steep headland, promontory, riverbank, or cliff.

"Borrow Areas" – the areas where materials are dug for use as fill, either onsite or off-site.

"Business day" – for the purposes of this permit, a business day is a calendar day on which construction activities will take place.

"Bypass" – the intentional diversion of waste streams from any portion of a treatment facility. See 40 CFR 122.41(m)(1)(i).

"Cationic Treatment Chemical" – polymers, flocculants, or other chemicals that contain an overall positive charge. Among other things, they are used to reduce turbidity in stormwater discharges by chemically bonding to the overall negative charge of suspended silts and other soil materials and causing them to bind together and settle out. Common examples of cationic treatment chemicals are chitosan and cationic PAM.

"Commencement of Construction Activities" – the initial disturbance of soils (or 'breaking ground') associated with clearing, grading, or excavating activities or other construction-related activities (e.g., grubbing; stockpiling of fill material; placement of raw materials at the site).

"Common Plan of Development or Sale" – A contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under one common plan. The "common plan" of development or sale is broadly defined as any announcement or piece of documentation (including a sign, public notice or hearing, sales pitch, advertisement, drawing, permit application, zoning request, computer design, etc.) or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating construction activities may occur on a specific plot.

"Construction Activities" – earth-disturbing activities, such as the clearing, grading, and excavation of land, and other construction-related activities (e.g., grubbing; stockpiling of fill material; placement of raw materials at the site) that could lead to the generation of pollutants. Some of the types of pollutants that are typically found at construction sites are:

- sediment;
- nutrients;
- heavy metals;
- pesticides and herbicides;
- oil and grease;
- bacteria and viruses;
- trash, debris, and solids;

- treatment polymers; and
- any other toxic chemicals.

"Construction and Development Effluent Limitations and New Source Performance Standards" (C&D Rule) – as published in 40 CFR § 450, the regulation requiring effluent limitations guidelines (ELGs) and new source performance standards (NSPS) for controlling the discharge of pollutants from construction sites.

"Construction Site" or "Site" – the land or water area where construction activities will occur and where stormwater controls will be installed and maintained. The construction site includes construction support activities, which may be located at a different part of the property from where the primary construction activity will take place, or on a different piece of property altogether.

"Construction Support Activity" – a construction-related activity that specifically supports the construction activity and involves earth disturbance or pollutant-generating activities of its own, and can include activities associated with concrete or asphalt batch plants, equipment staging yards, materials storage areas, excavated material disposal areas, and borrow areas.

"Construction Waste" – discarded material (such as packaging materials; scrap construction materials; masonry products; timber, steel, pipe, and electrical cuttings; plastics; and styrofoam).

"Conveyance Channel" – a temporary or permanent waterway designed and installed to safely convey stormwater flow within and out of a construction site.

"Critical Habitat" – as defined in the Endangered Species Act at 16 U.S.C. 1531 for a threatened or endangered species, (i) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 4 of the Endangered Species Act, on which are found those physical or biological features essential to the conservation of the species and which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 4 of the Endangered Species Act, upon a determination by the Secretary that such areas are essential for the conservation of the species.

"CWA" – the Clean Water Act or the Federal Water Pollution Control Act, 33 U.S.C. section 1251 et seq.

"Dewatering" – the act of draining accumulated stormwater and/or ground water from building foundations, vaults, and trenches, or other similar points of accumulation. Examples can include, but are not limited to:

- Surface area dewatering: water pumped from disturbed surface areas (e.g., trenches, sumps, excavation pits, or other excavations associated with construction where sediment-laden ground water or surface water/storm inflow must be removed) or from sediment basins or similar impoundments for maintenance or decommissioning purposes.
- Ground water dewatering: water discharged from well development, well pump tests, or pumping of ground water from a construction area. Common methods of ground water dewatering from a construction area include sumps and wells, generally described as follows:
  - Sumps: lowers ground water levels near the construction area. Dewatering using sumps consists of pumping ground water out of a lower collection point(s) typically gravity-fed by local ground water.
  - Wells: drilled wells, including bored/augured, driven, or jetted, which use vacuum or pumping to lower the ground water at greater depths than sumps. The two most common types of wells used for dewatering ground water are:

- Wellpoints: small-diameter shallow wells which are connected via a header pipe. A pump creates a vacuum in the header pipe.
- Deep Wells: larger-diameter holes, drilled relatively deep (typically greater than 10 feet), pumped by submersible electric pumps.

"Dewatering Water" – as used in this permit, water discharged from dewatering operations.

"Discharge" – when used without qualification, means the "discharge of a pollutant."

"Discharge of a Pollutant" – any addition of any "pollutant" or combination of pollutants to "waters of the United States" from any "point source," or any addition of any pollutant or combination of pollutants to the waters of the "contiguous zone" or the ocean from any point source other than a vessel or other floating craft which is being used as a means of transportation. This includes additions of pollutants into waters of the United States from: surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works. See 40 CFR 122.2.

"Discharge Point" – for the purposes of this permit, the location where collected and concentrated stormwater flows or dewatering water are discharged from the construction site.

"Discharge-Related Activity" – activities that cause, contribute to, or result in stormwater and allowable non-stormwater point source discharges, and measures such as the siting, construction, and operation of stormwater controls to control, reduce, or prevent pollutants from being discharged.

"Discharge to an Impaired Water" – for the purposes of this permit, a discharge to an impaired water occurs if the first water of the U.S. to which you discharge is identified by a State, Tribe, or EPA pursuant to Section 303(d) of the Clean Water Act as not meeting an applicable water quality standard and (1) requires development of a total maximum daily load (TMDL) (pursuant to section 303(d) of the CWA; or (2) is addressed by an EPA-approved or established TMDL; or (3) is not in either of the above categories but the waterbody is covered by a pollution control program that meets the requirements of 40 CFR 130.7(b)(1). For discharges that enter a storm sewer system prior to discharge, the water of the U.S. to which you discharge is the first water of the U.S. that receives the stormwater discharge from the storm sewer system.

"Domestic Waste" – for the purposes of this permit, typical household trash, garbage or rubbish items generated by construction activities.

"Drainageway" – an open linear depression, whether constructed or natural, that functions for the collection and drainage of surface water.

"Drought-Stricken Area" – for the purposes of this permit, an area in which the National Oceanic and Atmospheric Administration's U.S. Seasonal Drought Outlook indicates for the period during which the construction will occur that any of the following conditions are likely: (1) "Drought to persist or intensify", (2) "Drought ongoing, some improvement", (3) "Drought likely to improve, impacts ease", or (4) "Drought development likely". See http://www.cpc.ncep.noaa.gov/products/expert_assessment/sdo_summary.php.

"Earth-Disturbing Activity"– actions taken to alter the existing vegetation and/or underlying soil of a site, such as clearing, grading, site preparation (e.g., excavating, grubbing, cutting, and filling), soil compaction, and movement and stockpiling of top soils.

"Earth-Disturbing Activities Conducted Prior to Active Mining Activities" – Consists of two classes of earth-disturbing (i.e., clearing, grading and excavation) activities:

a. activities performed for purposes of mine site preparation, including: cutting new rights of way (except when related to access road construction); providing access to a mine site for vehicles and equipment (except when related to access road construction); other earth disturbances associated with site preparation activities on any areas where active mining

activities have not yet commenced (e.g., for heap leach pads, waste rock facilities, tailings impoundments, wastewater treatment plants); and

b. construction of staging areas to prepare for erecting structures such as to house project personnel and equipment, mill buildings, etc., and construction of access roads.

Note: only earth-disturbing activities associated with the construction of staging areas and the construction of access roads conducted prior to active mining (see (b) above) are considered to be "construction" and therefore stormwater discharges from these activities are eligible for coverage under this permit. See Part 1.2.1.b. The activities described in (a) above are not considered to be "construction" and therefore stormwater discharges associated with this activity are not eligible for coverage under this permit.

"Effective Operating Condition" – for the purposes of this permit, a stormwater control is kept in effective operating condition if it has been implemented and maintained in such a manner that it is working as designed to minimize pollutant discharges.

"Effluent Limitations" – for the purposes of this permit, any of the Part 2 or Part 3 requirements.

"Effluent Limitations Guideline" (ELG) – defined in 40 CFR § 122.2 as a regulation published by the Administrator under section 304(b) of the CWA to adopt or revise effluent limitations.

"Eligible" – for the purposes of this permit, refers to stormwater and allowable non-stormwater discharges that are authorized for coverage under this general permit.

"Emergency-Related Project" – a project initiated in response to a public emergency (e.g., mud slides, earthquake, extreme flooding conditions, disruption in essential public services), for which the related work requires immediate authorization to avoid imminent endangerment to human health or the environment, or to reestablish essential public services.

"Endangered Species" – defined in the Endangered Species Act at 16 U.S.C. 1531 as any species which is in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insecta determined by the Secretary to constitute a pest whose protection under the provisions of this Act would present an overwhelming and overriding risk to man.

"Excursion" – a measured value that exceeds a specified limit.

"Existing Site" – a site where construction activities commenced prior to February 16, 2017.

"Exit Points" – any points of egress from the construction site to be used by vehicles and equipment during construction activities.

"Exposed Soils" – for the purposes of this permit, soils that as a result of earth-disturbing activities are left open to the elements.

"Federal Facility" – any buildings, installations, structures, land, public works, equipment, aircraft, vessels, and other vehicles and property, owned by, or constructed or manufactured for the purpose of leasing to, the Federal government.

"Federal Operator" – an entity that meets the definition of "Operator" in this permit and is either any department, agency or instrumentality of the executive, legislative, and judicial branches of the Federal government of the United States, or another entity, such as a private contractor, performing construction activity for any such department, agency, or instrumentality.

"Final Stabilization" – on areas not covered by permanent structures, either (1) uniform, perennial vegetation *(e.g., evenly distributed, without large bare areas)* has been established, or for arid or semi-arid areas, will be established that provides 70 percent or more of the cover that is provided by vegetation native to local undisturbed areas, and/or (2) permanent non-

vegetative stabilization measures (e.g., riprap, gravel, gabions, and geotextiles) have been implemented to provide effective cover for exposed portions of the site

"General Contractor" – for the purposes of this permit, the primary individual or company solely accountable to perform a contract. The general contractor typically supervises activities, coordinates the use of subcontractors, and is authorized to direct workers at a site to carry out activities required by the permit.

"Hazardous Substances" or "Hazardous or Toxic Waste" – for the purposes of this permit, any liquid, solid, or contained gas that contain properties that are dangerous or potentially harmful to human health or the environment. See also 40 CFR §261.2.

"Historic Property" – as defined in the National Historic Preservation Act regulations, means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian Tribe or Native Hawaiian organization and that meet the National Register criteria.

"Impaired Water"– a water identified by the State, Tribe, or EPA as not meeting an applicable water quality standard and (1) requires development of a TMDL (pursuant to section 303(d) of the CWA; or (2) is addressed by an EPA-approved or established TMDL; or (3) is not in either of the above categories but the waterbody is covered by a pollution control program that meets the requirements of 40 CFR 130.7(b)(1).

"Impervious Surface" – for the purpose of this permit, any land surface with a low or no capacity for soil infiltration including, but not limited to, pavement, sidewalks, parking areas and driveways, packed gravel or soil, or rooftops.

"Indian Country" or "Indian Country Lands" – defined at 40 CFR §122.2 as:

1. All land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation;
2. All dependent Indian communities with the borders of the United States whether within the originally or subsequently acquired territory thereof, and whether within or without the limits of a State; and
3. All Indian allotments, the Indian titles to which have not been extinguished, including rights-of-ways running through the same.

"Infeasible" – for the purpose of this permit, infeasible means not technologically possible or not economically practicable and achievable in light of best industry practices. EPA notes that it does not intend for any permit requirement to conflict with State water rights law.

"Install" or "Installation" – when used in connection with stormwater controls, to connect or set in position stormwater controls to make them operational.

"Jar test" – a test designed to simulate full-scale coagulation/flocculation/sedimentation water treatment processes by taking into account the possible conditions.

Lands of Exclusive Federal Jurisdiction – all land where the Federal government has exclusive jurisdiction in relative respects.

"Landward" – positioned or located away from a waterbody, and towards the land.

"Large Construction Activity" – defined at 40 CFR § 122.26(b)(14)(x) and incorporated here by reference. Large construction activity includes clearing, grading, and excavating resulting in a land disturbance that will disturb equal to or greater than five acres of land or will disturb less

than five acres of total land area but is part of a larger common plan of development or sale that will ultimately disturb equal to or greater than five acres. Large construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site.

"Linear Construction Site" – includes the construction of roads, bridges, conduits, substructures, pipelines, sewer lines, towers, poles, cables, wires, connectors, switching, regulating and transforming equipment and associated ancillary facilities in a long, narrow area.

"Minimize" – to reduce and/or eliminate to the extent achievable using stormwater controls that are technologically available and economically practicable and achievable in light of best industry practices.

"Mining Activity" – for the purposes of this permit, includes mining-related construction activities defined at 40 CFR 122.26(b)(14)(x) and 122.26(b)(15)(i), and active mining activities defined at 40 CFR 122.26(b)(14)(iii). Both of these sub categories of activities include earth-disturbing activities, with the latter also including such activities as: extraction, removal or recovery, and beneficiation of mined material from the earth; removal of overburden and waste rock to expose mineable material; and site reclamation and closure activities.

"Mining Operations" – for the purposes of this permit, mining operations are grouped into two distinct categories, with distinct effluent limits and requirements applicable to each: 1) earth-disturbing activities conducted prior to active mining activities; and 2) active mining activities, which includes reclamation.

"Municipal Separate Storm Sewer System" or "MS4" – defined at 40 CFR §122.26(b)(8) as a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains):

1. Owned and operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian Tribe or an authorized Indian Tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to waters of the United States;
2. Designed or used for collecting or conveying stormwater;
3. Which is not a combined sewer; and
4. Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR §122.2.

"National Pollutant Discharge Elimination System" (NPDES) – defined at 40 CFR §122.2 as the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of CWA. The term includes an 'approved program.'

"Native Topsoil" – the uppermost layer of naturally occurring soil for a particular area, and is often rich in organic matter, biological activity, and nutrients.

"Natural Buffer" – for the purposes of this permit, an area of undisturbed natural cover surrounding waters of the United States within which construction activities are restricted. Natural cover includes the vegetation, exposed rock, or barren ground that exists prior to commencement of earth-disturbing activities.

"Natural Vegetation" – vegetation that occurs spontaneously without regular management, maintenance, or species introductions or removals, and that generally has a strong component of native species..

"New Operator of a Permitted Site" – an operator that through transfer of ownership and/or operation replaces the operator of an already permitted construction site that is either a "new site" or an "existing site".

"New Site" – a site where construction activities commenced on or after February 16, 2017.

"New Source" – for the purposes of this permit, a construction project that commenced construction activities after February 1, 2010.

"New Source Performance Standards (NSPS)" – for the purposes of this permit, NSPS are technology-based standards that apply to construction sites that are new sources under 40 CFR 450.24.

"Non-Stormwater Discharges" – discharges that do not originate from storm events. They can include, but are not limited to, discharges of process water, air conditioner condensate, non-contact cooling water, vehicle wash water, sanitary wastes, concrete washout water, paint wash water, irrigation water, or pipe testing water.

"Non-Turbid" – a discharge that is free from visual turbidity.

"Notice of Intent" (NOI) – the form (electronic or paper) required for authorization of coverage under the Construction General Permit.

"Notice of Termination" (NOT) – the form (electronic or paper) required for terminating coverage under the Construction General Permit.

"NPDES eReporting Tool" (NeT) – EPA's online system for submitting electronic Construction General Permit forms.

"Operational" – for the purposes of this permit, stormwater controls are made "operational" when they have been installed and implemented, are functioning as designed, and are properly maintained.

"Operator" – for the purposes of this permit and in the context of stormwater discharges associated with construction activity, any party associated with a construction project that meets either of the following two criteria:

1. The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications *(*e.g. *in most cases this is the owner of the site)*; or
2. The party has day-to-day operational control of those activities at a project that are necessary to ensure compliance with the permit conditions (e.g.*, they are authorized to direct workers at a site to carry out activities required by the permit; in most cases this is the general contractor of the project)*.

This definition is provided to inform permittees of EPA's interpretation of how the regulatory definitions of "owner or operator" and "facility or activity" are applied to discharges of stormwater associated with construction activity. Subcontractors generally are not considered operators for the purposes of this permit.

"Ordinary High Water Mark" – the line on the shore established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, and/or the presence of litter and debris.

"Permitting Authority" – for the purposes of this permit, EPA, a Regional Administrator of EPA, or an authorized representative.

"Point(s) of Discharge" – see "Discharge Point."

"Point Source" – any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff.

"Pollutant" – defined at 40 CFR §122.2. A partial listing from this definition includes: dredged spoil, solid waste, sewage, garbage, sewage sludge, chemical wastes, biological materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial or municipal waste.

"Pollution Prevention Controls" – stormwater controls designed to reduce or eliminate the addition of pollutants to construction site discharges through analysis of pollutant sources, implementation of proper handling/disposal practices, employee education, and other actions.

"Polymers" – for the purposes of this permit, coagulants and flocculants used to control erosion on soil or to enhance the sediment removal capabilities of sediment traps or basins. Common construction site polymers include polyacrylamide (PAM), chitosan, alum, polyaluminum chloride, and gypsum.

"Prohibited Discharges" – discharges that are not allowed under this permit, including:

1. Wastewater from washout of concrete;
2. Wastewater from washout and cleanout of stucco, paint, form release oils, curing compounds and other construction materials;
3. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance;
4. Soaps or solvents used in vehicle and equipment washing;
5. Toxic or hazardous substances from a spill or other release; and
6. Waste, garbage, floatable debris, construction debris, and sanitary waste.

"Provisionally Covered Under this Permit" – for the purposes of this permit, EPA provides temporary coverage under this permit for emergency-related projects prior to receipt of a complete and accurate NOI. Discharges from earth-disturbing activities associated with the emergency-related projects are subject to the terms and conditions of the permit during the period of temporary coverage.

"Qualified Person" – a person knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention, who possesses the appropriate skills and training to assess conditions at the construction site that could impact stormwater quality, and the appropriate skills and training to assess the effectiveness of any stormwater controls selected and installed to meet the requirements of this permit.

"Receiving Water" – a "Water of the United States" as defined in 40 CFR §122.2 into which the regulated stormwater discharges.

"Run-On" – sources of stormwater that drain from land located upslope or upstream from the regulated site in question.

"Seasonally Dry Period" – a month in which the long-term average total precipitation is less than or equal to 0.5 inches. Refer to EPA's Seasonally Dry Period Locator and supporting maps for assistance in determining whether a site is operating during a seasonally dry period for the area,

located at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates.

"Sediment-Related parameter" – for the purposes of this permit, a pollutant parameter that is closely related to sediment such as turbidity, total suspended solids (TSS), transparency, sedimentation, and siltation.

"Semi-Arid Areas" – areas with an average annual rainfall of 10 to 20 inches. For assistance in determining average annual rainfall in specific locations, refer to the NOAA National Mapping webpage (https://www.ncdc.noaa.gov/cag/national/mapping), the PRISM Climate Group's Time Series Values for individual locations (https://prism.oregonstate.edu/explorer/), or EPA's US EPA EnviroAtlas (https://www.epa.gov/enviroatlas).

"Shared Control" - for the purposes of this permit, a stormwater control, such as a sediment basin or pond, used by two or more operators that is installed and maintained for the purpose of minimizing and controlling pollutant discharges from a construction site with multiple operators associated with a common plan of development or sale. Any operators that are contributing stormwater from their construction activities to a shared control are considered to rely upon a shared control.

"Small Construction Activity" – defined at 40 CFR §122.26(b)(15) and incorporated here by reference. A small construction activity includes clearing, grading, and excavating resulting in a land disturbance that will disturb equal to or greater than one (1) acre and less than five (5) acres of land or will disturb less than one (1) acre of total land area but is part of a larger common plan of development or sale that will ultimately disturb equal to or greater than one (1) acre and less than five (5) acres. Small construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the site.

"Small Residential Lot" – for the purpose of this permit, a lot being developed for residential purposes that will disturb less than 1 acre of land, but is part of a larger residential project that will ultimately disturb greater than or equal to 1 acre.

"Snowmelt" – the conversion of snow into overland stormwater and ground water flow as a result of warmer temperatures.

"Spill" – for the purpose of this permit, the release of a hazardous or toxic substance from its container or containment.

"Stabilization" – the use of vegetative and/or non-vegetative cover to prevent erosion and sediment loss in areas exposed through the construction process.

"Steep Slopes" – where a State, Tribe, local government, or industry technical manual (e.g., stormwater BMP manual) has defined what is to be considered a "steep slope", this permit's definition automatically adopts that definition. Where no such definition exists, steep slopes are automatically defined as those that are 15 percent or greater in grade.

"Storm Sewer System" – a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains) designed or used for collecting or conveying stormwater.

"Stormwater" – stormwater runoff, snowmelt runoff, and surface runoff and drainage.

"Stormwater Control" - refers to any best management practice or other method (including narrative effluent limitations) used to prevent or reduce the discharge of pollutants to waters of the United States.

"Stormwater Discharge Associated with Construction Activity" – as used in this permit, a discharge of pollutants in stormwater to waters of the United States from areas where earth-

disturbing activities (e.g., clearing, grubbing, grading, or excavation) occur, or where construction materials or equipment storage or maintenance (e.g., fill piles, borrow area, concrete truck chute washdown, fueling), or other industrial stormwater directly related to the construction process (e.g., concrete or asphalt batch plants), are located.

"Stormwater Inlet" – a structure placed below grade to conduct water used to collect stormwater runoff for conveyance purposes.

"Stormwater Team" – the group of individuals responsible for oversight of the development and modifications of the SWPPP, and oversight of compliance with the permit requirements. The individuals on the "Stormwater Team" must be identified in the SWPPP.

"Storm Event" – a precipitation event that results in a measurable amount of precipitation.

"Storm Sewer" – a system of pipes (separate from sanitary sewers) that carries stormwater runoff from buildings and land surfaces.

"Subcontractor" – for the purposes of this permit, an individual or company that takes a portion of a contract from the general contractor or from another subcontractor.

"SWPPP" (Stormwater Pollution Prevention Plan) – a site-specific, written document that, among other things: (1) identifies potential sources of stormwater pollution at the construction site; (2) describes stormwater controls to reduce or eliminate pollutants in stormwater discharges from the construction site; and (3) identifies procedures the operator will implement to comply with the terms and conditions of this general permit.

"Temporary Stabilization" – a condition where exposed soils or disturbed areas are provided temporary vegetative and/or non-vegetative protective cover to prevent erosion and sediment loss. Temporary stabilization may include temporary seeding, geotextiles, mulches, and other techniques to reduce or eliminate erosion until either final stabilization can be achieved or until further construction activities take place to re-disturb this area.

"Thawing Conditions" – for the purposes of this permit, thawing conditions are expected based on the historical likelihood of two or more days with daytime temperatures greater than 32˚F. This date can be determined by looking at historical weather data. Note: the estimation of thawing conditions is for planning purposes only. During construction the permittee will be required to conduct site inspections based upon actual conditions (i.e., if thawing conditions occur sooner than expected, the permittee will be required to conduct inspections at the regular frequency).

"Threatened Species" – defined in the Endangered Species Act at 16 U.S.C. 1531 as any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

"Tier 2 Waters" – for antidegradation purposes, pursuant to 40 CFR 131.12(a)(2), those waters that are characterized as having water quality that exceeds the levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water.

"Tier 2.5 Waters" – for antidegradation purposes, those waters designated by States or Tribes as requiring a level of protection equal to and above that given to Tier 2 waters, but less than that given Tier 3 waters. Some States have special requirements for these waters.

"Tier 3 Waters" – for antidegradation purposes, pursuant to 40 CFR 131.12(a)(3), Tier 3 waters are identified by States as having high quality waters constituting an Outstanding National Resource Water (ONRW), such as waters of National Parks and State Parks, wildlife refuges, and waters of exceptional recreational or ecological significance.

"Total Maximum Daily Load" or "TMDL" – the sum of the individual wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and natural background. If receiving water has only one point source discharger, the TMDL is the sum of that point source

WLA plus the LAs for any nonpoint sources of pollution and natural background sources, tributaries, or adjacent segments. TMDLs can be expressed in terms of mass per time, toxicity, or other appropriate measure.

"Toxic Waste" – see "Hazardous Substances."

"Treatment Chemicals" – polymers, flocculants, or other chemicals used to reduce turbidity in stormwater.

"Turbidity" – a condition of water quality characterized by the presence of suspended solids and/or organic material.

"Uncontaminated Discharge" – in the context of authorized non-stormwater discharges, a discharge that meets applicable water quality standards.

"Upland" – the dry land area above and 'landward' of the ordinary high water mark.

"Upset" – Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond your reasonable control. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. See 40 CFR 122.41(n)(1).

"Visual Turbidity" – for the purposes of this permit, visual turbidity is present when there is a sediment plume in the discharge or the discharge appears cloudy, opaque, or has a visible contrast that can be visually identified by an observer.

"Water-Dependent Structures" – structures or facilities that are required to be located directly adjacent to a waterbody or wetland, such as a marina, pier, boat ramp, etc.

"Water Quality Standards" – defined in 40 CFR § 131.3, and are provisions of State (including Tribal) or Federal law which consist of a designated use or uses for the waters of the United States, water quality criteria for such waters based upon such uses, and an antidegradation policy to protect high-quality waters. Water quality standards protect the public health or welfare, enhance the quality of water and serve the purposes of the Act.

"Waters of the United States" – see definition at 40 CFR 122.2.

"Wetland" – those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. On-site evaluations are typically required to confirm the presence and boundaries of wetlands.

2. Acronyms

ACHP – Advisory Council on Historic Preservation

BMP – Best Management Practice

CBI – Confidential Business Information

CGP – Construction General Permit

CFR – Code of Federal Regulations

CWA – Clean Water Act

CZMA – Coastal Zone Management Act

ECHO – EPA Enforcement and Compliance History Online

ELG – Effluent Limitations Guideline
EPA – United States Environmental Protection Agency
ESA – Endangered Species Act
FR – Federal Register
MS4 – Municipal Separate Storm Sewer System
MSGP – Multi-Sector General Permit
NEPA – National Environmental Policy Act
NeT – NPDES eReporting Tool
NTU - Nephelometric turbidity units
NHPA – National Historic Preservation Act
NMFS – United States National Marine Fisheries Service
NPDES – National Pollutant Discharge Elimination System
NOI – Notice of Intent
NOT – Notice of Termination
NPDES – National Pollutant Discharge Elimination System
NRC – National Response Center
NRCS – National Resources Conservation Service
NSPS – New Source Performance Standards
ONRW – Outstanding National Resource Water
PAM – Polyacrylamide
POTW – Publicly Owned Treatment Works
RUSLE – Revised Universal Soil Loss Equation
SDS – Safety Data Sheet
SHPO – State Historic Preservation Office
SPCC – Spill Prevention Control and Countermeasure
SWPPP – Stormwater Pollution Prevention Plan
THPO – Tribal Historic Preservation Office
TMDL – Total Maximum Daily Load
TSS – Total Suspended Solids
UIC – Underground Injection Control
USDA – United States Department of Agriculture
USFWS – United States Fish and Wildlife Service
USGS – United States Geological Survey
WQS – Water Quality Standard

Appendix B - Permit Areas Eligible for Coverage and EPA Regional Addresses

Permit coverage for stormwater discharges from construction activity occurring within the following areas is provided by legally separate and distinctly numbered permits. For assistance in determining whether your construction activities are located within Indian country, refer to the Bureau of Indian Affairs' digital map of the land areas of Federally-recognized Tribes at https://biamaps.doi.gov/indianlands/#.

B.1 EPA Region 1

The permit offers coverage for stormwater discharges from construction activity from the following areas in EPA Region 1:

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
CTR10I000	Indian country within the State of Connecticut
MAR100000	Commonwealth of Massachusetts (except Indian country)
MAR10I000	Indian country within the State of Massachusetts
NHR100000	State of New Hampshire
RIR10I000	Indian country within the State of Rhode Island
VTR10F000	Areas in the State of Vermont located at a Federal Facility (as defined in Appendix A)
1R10I000	All areas of Indian country not identified above that are not already covered by an EPA-approved permitting program with authorization to issue permits in Indian country
01R10F000	All Lands of Exclusive Federal Jurisdiction, except in the State of Vermont (which is already covered by Permit No. VTR10F000) that are on the confirmed 2024 list below provided by the National Parks Service (NPS) or on the list compiled by the U.S. General Services Administration as of 1962 (available at https://publiclandjurisdiction.com/wp-content/uploads/2020/01/JURISD1.pdf). The NPS list includes the following: Acadia National Park.

For stormwater discharges in EPA Region 1 outside the areas of coverage identified above, please contact your State NPDES permitting authority to obtain coverage under a State-issued NPDES permit.

EPA Region 1 Address:
U.S. EPA Region 1
Office of Ecosystem Protection
Stormwater and Construction Permits Section
5 Post Office Square, Suite 100
(OEP 06-1)
Boston, MA 02109-3912

B.2 EPA Region 2

The permit offers coverage for stormwater discharges from construction activity from the following areas in EPA Region 2:

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
NYR10I000	Indian country within the State of New York
PRR100000	Commonwealth of Puerto Rico
02R10I000	All areas of Indian country not identified above that are not already covered by an EPA-approved permitting program with authorization to issue permits in Indian country
02R10F000	All Lands of Exclusive Federal Jurisdiction

For stormwater discharges in EPA Region 2 outside the areas of coverage identified above, please contact your State NPDES permitting authority to obtain coverage under a State-issued NPDES permit.

EPA Region 2 Address:
For Puerto Rico:
U.S. EPA Region 2
Caribbean Environmental Protection Division
NPDES Stormwater Program
City View Plaza II – Suite 7000
48 Rd. 165 Km 1.2
Guaynabo, PR 00968-8069

For New York:
U.S. EPA Region 2
NPDES Stormwater Program
290 Broadway, 24th Floor
New York, NY 10007-1866

B.3 EPA Region 3

The permit offers coverage for stormwater discharges from construction activity from the following areas in EPA Region 3:

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
DCR100000	District of Columbia
DER10F000	Areas in the State of Delaware located at a Federal Facility (as defined in Appendix A)
VAR10I000	Indian country within the State of Virginia
03R10I000	All areas of Indian country not identified above that are not already covered by an EPA-approved permitting program with authorization to issue permits in Indian country
03R10F000	All Lands of Exclusive Federal Jurisdiction, except in the State of Delaware (which is already covered by Permit No. DER10F000) that are on the confirmed 2024 list below provided by the National Parks Service (NPS) or on the list compiled by the U.S. General Services Administration as of 1962 (available at https://publiclandjurisdiction.com/wp-content/uploads/2020/01/JURISD1.pdf). The NPS list includes the following: Antietam National Battlefield, Baltimore-Washington Parkway, Battleground National Cemetery, Fredericksburg & Spotsylvania National Military Park, George Washington Memorial Parkway, Gettysburg National Military Park, Petersburg National Battlefield, and Shenandoah National Park.[1] EPA notes that the 1962 list is not all-inclusive and that the information contained in these lists has not been recently confirmed and/or updated.

For stormwater discharges in EPA Region 3 outside the areas of coverage identified above, please contact your State NPDES permitting authority to obtain coverage under a State-issued NPDES permit.

EPA Region 3 Address:
U.S. EPA Region 3
Clean Water Branch
Permits Section, Mailcode 3WD41
Four Penn Center
1600 John F Kennedy Blvd.
Philadelphia, PA 19103-2029

[1] In its Clean Water Act section 401 certification, EPA Region 3 authorized coverage for three additional locations, Fort McHenry National Monument & Historic Shrine, Fort Necessity National Battlefield, and Independence National Historic Park. Subsequent to the certification, it became known that these locations are not considered Lands of Exclusive Federal Jurisdiction, and therefore construction activities in these areas are not eligible for coverage under the CGP.

B.4 EPA Region 4

The permit offers coverage for stormwater discharges from construction activity from the following areas in EPA Region 4:

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
ALR10I000	Indian country within the State of Alabama
FLR10I00E	Indian country within the State of Florida
MSR10I000	Indian country within the State of Mississippi
NCR10I000	Indian country within the State of North Carolina
04R10I000	All areas of Indian country not identified above that are not already covered by an EPA-approved permitting program with authorization to issue permits in Indian country (except Catawba lands in South Carolina)
04R10F000	All Lands of Exclusive Federal Jurisdiction

For stormwater discharges in EPA Region 4 outside the areas of coverage identified above, please contact your State NPDES permitting authority to obtain coverage under a State-issued NPDES permit.

EPA Region 4 Address:
U.S. EPA Region 4
Water Protection Division
NPDES Stormwater Program
Atlanta Federal Center
61 Forsyth Street SW
Atlanta, GA 30303-3104

B.5 EPA Region 5

The permit offers coverage for stormwater discharges from construction activity from the following areas in EPA Region 5:

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
MIR10I000	Indian country within the State of Michigan, except the L'Anse Reservation of the Keweenaw Bay Indian Community
MNR10I000	Indian country within the State of Minnesota, except sites located in the Fond du Lac Reservation discharging to Outstanding Reservation Resources Waters (ORRWs)[2]
WIR10I000	Indian country within the State of Wisconsin, except sites located in the Bad River Band of Lake Superior Tribe of Chippewa Indians discharging to Outstanding Tribal Resource Waters (OTRWs) or Tier 3 waters[3]
05R10I000	All areas of Indian country not identified above that are not already covered by an EPA-approved permitting program with authorization to issue permits in Indian country
05R10F000	All Lands of Exclusive Federal Jurisdiction

For stormwater discharges in EPA Region 5 outside the areas of coverage identified above, please contact your State NPDES permitting authority to obtain coverage under a State-issued NPDES permit.

EPA Region 5 Address:
U.S. EPA Region 5
NPDES Program Branch
77 W. Jackson Blvd.
Mail Code WN16J
Chicago, IL 60604-3507

[2] The Tribe has identified Perch Lake, Rice Portage Lake, Miller Lake, Deadfish Lake, and Jaskari Lake as ORRWs.
[3] The Tribe has identified the following as OTRWs or Tier 3 waters: Kakagon Slough and the lower wetland reaches of its tributaries that support wild rice, Kakagon River, Bad River Slough, Honest John Lake, Bog Lake, a portion of Bad River, from where it enters the Reservation through the confluence with the White River, and Potato River.

B.6 EPA Region 6

The permit offers coverage for stormwater discharges from construction activity from the following areas in EPA Region 6:

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
LAR10I000	Indian country within the State of Louisiana
NMR100000	State of New Mexico, except Indian country
NMR10I000	Indian country within the State of New Mexico, except Navajo Reservation Lands that are covered under Arizona permit AZR10000I and Ute Mountain Reservation Lands that are covered under Colorado permit COR10000I.
OKR10I000	Indian country within the State of Oklahoma, except areas of Indian country covered by an extension of state program authority pursuant to Section 10211 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act (SAFETEA).
OKR10F000	Discharges in the State of Oklahoma that are not under the authority of the Oklahoma Department of Environmental Quality, or the Oklahoma Department of Agriculture and Forestry including activities associated with oil and gas exploration, drilling, operations, and pipelines (includes SIC Groups 13 and 46, and SIC codes 492 and 5171), and point source discharges associated with agricultural production, services, and silviculture (includes SIC Groups 01, 02, 07, 08, 09).
TXR10I000	Indian country within the State of Texas
06R10I000	All areas of Indian country not identified above that are not already covered by an EPA-approved permitting program with authorization to issue permits in Indian country
06R10F000	All Lands of Exclusive Federal Jurisdiction

For stormwater discharges in EPA Region 6 outside the areas of coverage identified above, please contact your State NPDES permitting authority to obtain coverage under a State-issued NPDES permit.

EPA Region 6 Address:
U.S. EPA Region 6
NPDES Stormwater Program (WQ-PP)
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

B.7 EPA Region 7

The permit offers coverage for stormwater discharges from construction activity from the following areas in EPA Region 7:

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
IAR10I000	Indian country within the State of Iowa
KSR10I000	Indian country within the State of Kansas
NER10I000	Indian country within the State of Nebraska, except Pine Ridge Reservation lands (see Region 8)
07R10I000	All areas of Indian country not identified above that are not already covered by an EPA-approved permitting program with authorization to issue permits in Indian country
07R10F000	All Lands of Exclusive Federal Jurisdiction

For stormwater discharges in EPA Region 7 outside the areas of coverage identified above, please contact your State NPDES permitting authority to obtain coverage under a State-issued NPDES permit.

EPA Region 7 Address:
U.S. EPA Region 7
NPDES Stormwater Program
11201 Renner Blvd
Lenexa, KS 66219

B.8 EPA Region 8

The permit offers coverage for stormwater discharges from construction activity from the following areas in EPA Region 8:

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
COR10F000	Areas in the State of Colorado located at a Federal Facility (as defined in Appendix A), except those located on Indian country
COR10I000	Indian country within the State of Colorado, as well as the portion of the Ute Mountain Reservation located in New Mexico
MTR10I000	Indian country within the State of Montana
NDR10I000	Indian country within the State of North Dakota, as well as that portion of the Standing Rock Reservation located in South Dakota (except for the portion of the lands within the former boundaries of the Lake Traverse Reservation which is covered under South Dakota permit SDR10000I listed below)
SDR10I000	Indian country within the State of South Dakota, as well as the portion of the Pine Ridge Reservation located in Nebraska and the portion of the lands within the former boundaries of the Lake Traverse Reservation located in North Dakota (except for the Standing Rock Reservation which is covered under North Dakota permit NDR10000I listed above)
UTR10I000	Indian country within the State of Utah, except Goshute and Navajo Reservation lands (see Region 9)
WYR10I000	Indian country within the State of Wyoming
08R10I000	All areas of Indian country not identified above that are not already covered by an EPA-approved permitting program with authorization to issue permits in Indian country
08R10F000	All Lands of Exclusive Federal Jurisdiction, except in the State of Colorado (which is already covered by Permit No. COR10F000)

For stormwater discharges in EPA Region 8 outside the areas of coverage identified above, please contact your State NPDES permitting authority to obtain coverage under a State-issued NPDES permit.

EPA Region 8 Address:
EPA Region 8 Storm Water Program
Mailcode: 8P-W-WW
1595 Wynkoop Street
Denver, CO 80202-1129

B.9 EPA Region 9

The permit offers coverage for stormwater discharges from construction activity from the following areas in EPA Region 9:

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
ASR100000	Island of American Samoa
AZR10I000	Indian country within the State of Arizona, as well as Navajo Reservation lands in New Mexico and Utah
CAR10I000	Indian country within the State of California
GUR100000	Island of Guam
JAR100000	Johnston Atoll
MPR100000	Commonwealth of the Northern Mariana Islands
MWR100000	Midway Island and Wake Island
NVR10000I	Indian country within the State of Nevada, as well as the Duck Valley Reservation in Idaho, the Fort McDermitt Reservation in Oregon and the Goshute Reservation in Utah
09R10I000	All areas of Indian country not identified above that are not already covered by an EPA-approved permitting program with authorization to issue permits in Indian country
09R10F000	All Lands of Exclusive Federal Jurisdiction

For stormwater discharges in EPA Region 9 outside the areas of coverage identified above, please contact your State NPDES permitting authority to obtain coverage under a State-issued NPDES permit.

EPA Region 9 Address:
U.S. EPA Region 9
Water Division
NPDES Stormwater Program (WTR-2-3)
75 Hawthorne Street
San Francisco, CA 94105-3901

B.10 EPA Region 10

The permit offers coverage for stormwater discharges from construction activity from the following areas in EPA Region 10:

Permit No.	Areas of Coverage/Where EPA is Permitting Authority
AKR10I000	Indian country lands as defined in 18 U.S.C. 1151 within the State of Alaska
AKR10F000	Denali National Park and Preserve
IDR10I000	Indian country within the State of Idaho, except Duck Valley Reservation lands (see Region 9)
ORR10I000	Indian country within the State of Oregon, except Fort McDermitt Reservation lands (see Region 9)
WAR10F000	Areas in the State of Washington, except those located on Indian country, subject to construction activity by a Federal Operator
WAR10I000	Indian country within the State of Washington
010R10I000	All areas of Indian country not identified above that are not already covered by an EPA-approved permitting program with authorization to issue permits in Indian country
010R10F000	All Lands of Exclusive Federal Jurisdiction, except Denali National Park (Denali National Park is already covered by Permit No. AKR10F000) and areas in the State of Washington subject to construction activity by a Federal Operator (which is already covered by Permit No. WAR10F000)

For stormwater discharges in EPA Region 10 outside the areas of coverage identified above, please contact your State NPDES permitting authority to obtain coverage under a State-issued NPDES permit.

EPA Region 10 Address:
U.S. EPA Region 10
NPDES Stormwater Program
1200 6th Avenue (OWW-191)
Seattle, WA 98101-3140

Appendix C - Small Construction Waivers and Instructions

These waivers are only available to stormwater discharges associated with small construction activities (i.e., 1-5 acres). As the operator of a small construction activity, you may be able to qualify for a waiver in lieu of needing to obtain coverage under this general permit based on: (A) a low rainfall erosivity factor, (B) a TMDL analysis, or (C) an equivalent analysis that determines allocations for small construction sites are not needed. Each operator, otherwise needing permit coverage, must notify EPA of its intention for a waiver. It is the responsibility of those individuals wishing to obtain a waiver from coverage under this general permit to submit a complete and accurate waiver certification as described below. Where the operator changes or another is added during the construction project, the new operator must also submit a waiver certification to be waived.

C.1 Rainfall Erosivity Waiver

Under this scenario the small construction project's rainfall erosivity factor calculation ("R" in the Revised Universal Soil Loss Equation) is less than five during the period of construction activity. The operator must certify to EPA that construction activity will occur only when the rainfall erosivity factor is less than five. The period of construction activity begins at initial earth disturbance and ends with final stabilization. Where vegetation will be used for final stabilization, the date of installation of a stabilization practice that will provide interim non-vegetative stabilization can be used for the end of the construction period, provided the operator commits (as a condition of waiver eligibility) to periodically inspect and properly maintain the area until the criteria for final stabilization as defined in the CGP have been met. If use of this interim stabilization eligibility condition was relied on to qualify for the waiver, signature on the waiver with its certification statement constitutes acceptance of and commitment to complete the final stabilization process. The operator must submit a waiver certification to EPA prior to commencing construction activities.

> *Note: The rainfall erosivity factor "R" is determined in accordance with Chapter 2 of Agriculture Handbook Number 703, Predicting Soil Erosion by Water: A Guide to Conservation Planning With the Revised Universal Soil Loss Equation (RUSLE), pages 21–64, dated January 1997; United States Department of Agriculture (USDA), Agricultural Research Service.*

EPA has developed an online rainfall erosivity calculator to help small construction sites determine potential eligibility for the rainfall erosivity waiver. You can access the calculator from EPA's website at: https://www.epa.gov/npdes/rainfall-erosivity-factor-calculator-small-construction-sites. The R factor can easily be calculated by using the construction site latitude/longitude or address and estimated start and end dates of construction. This calculator may also be useful in determining the time periods during which construction activity could be waived from permit coverage. You may find that moving your construction activity by a few weeks or expediting site stabilization will allow you to qualify for the waiver. Use this online calculator or the Construction Rainfall Erosivity Waiver Fact Sheet (https://www.epa.gov/sites/production/files/2015-10/documents/fact3-1.pdf) to assist in determining the R Factor for your small construction site.

If you are the operator of the construction activity and eligible for a waiver based on low erosivity potential, you can submit a rainfall erosivity waiver electronically via EPA's NPDES eReporting Tool (NeT) (https://www.epa.gov/npdes/stormwater-discharges-construction-activities#ereporting), unless you received a waiver from your EPA Regional Office (see Part 1.4.1 of the CGP for information about receiving a waiver from electronic reporting).

Note: If the R factor is five or greater, you do not qualify for the rainfall erosivity waiver, and must obtain coverage under an NPDES permit (e.g., the CGP), unless you qualify for the Water Quality Waiver as described in section B below.

If your small construction project continues beyond the projected completion date given on the waiver certification, you must recalculate the rainfall erosivity factor for the new project duration. If the R factor is below five, you must update all applicable information on the waiver certification and retain a copy of the revised waiver as part of your records. The new waiver certification must be submitted prior to the projected completion date listed on the original waiver form to assure your exemption from permitting requirements is uninterrupted. If the new R factor is five or above, you must obtain NPDES permit coverage.

C.2 TMDL Waiver

This waiver is available if EPA has established or approved a TMDL that addresses the pollutant(s) of concern for the impaired water and has determined that controls on stormwater discharges from small construction activity are not needed to protect water quality. The pollutant(s) of concern include sediment (such as total suspended solids, turbidity or siltation) and any other pollutant that has been identified as a cause of impairment of any waterbody that will receive a discharge from the construction activity. Information on TMDLs that have been established or approved by EPA is available from EPA online at https://www.epa.gov/tmdl and from State and Tribal water quality agencies.

If you are the operator of the construction activity and eligible for a waiver based on compliance with an EPA-established or approved TMDL, you must provide the following information in order to be waived from permitting requirements:

1. Name, address and telephone number of the construction site operator(s);
2. Name (or other identifier), address, county or similar governmental subdivision, and latitude/longitude of the construction project or site;
3. Estimated construction start and completion (i.e., final stabilization) dates, and total acreage (to the nearest quarter acre) to be disturbed;
4. The name of the waterbody(s) that would be receiving stormwater discharges from your construction project;
5. The name and approval date of the TMDL;
6. A statement, signed and dated by an authorized representative as provided in Appendix G, Subsection G.11, that certifies that the construction activity will take place and that the stormwater discharges will occur, within the drainage area addressed by the TMDL.

C.3 Equivalent Analysis Waiver

This waiver is available for discharges to non-impaired waters only. The operator can develop an equivalent analysis that determines allocations for his/her small construction site for the pollutant(s) of concern or determines that such allocations are not needed to protect water quality. This waiver requires a small construction operator to develop an equivalent analysis based on existing in-stream concentrations, expected growth in pollutant concentrations from all sources, and a margin of safety.

If you are a construction operator who wants to use this waiver, you must develop your equivalent analysis and provide the following information to be waived from permitting requirements:

1. Name, address and telephone number of the construction site operator(s);

2. Name (or other identifier), address, county or similar governmental subdivision, and latitude/longitude of the construction project or site;
3. Estimated construction start and completion (i.e., final stabilization) dates, and total acreage (to the nearest quarter acre) to be disturbed;
4. The name of the waterbody(s) that would be receiving stormwater discharges from your construction project;
5. Your equivalent analysis;
6. A statement, signed and dated by an authorized representative as provided in Appendix G, Subsection G.11, that certifies that the construction activity will take place and that the stormwater discharges will occur, within the drainage area addressed by the equivalent analysis.

C.4 Waiver Deadlines and Submissions

1. Waiver certifications must be submitted prior to commencement of construction activities.
2. If you submit a TMDL or equivalent analysis waiver request, you are not waived until EPA approves your request. As such, you may not commence construction activities until receipt of approval from EPA.
3. Late Notifications: Operators are not prohibited from submitting waiver certifications after initiating clearing, grading, excavation activities, or other construction activities. The Agency reserves the right to take enforcement for any unpermitted discharges that occur between the time construction commenced and waiver authorization is granted.

Submittal of a waiver certification is an optional alternative to obtaining permit coverage for discharges of stormwater associated with small construction activity, provided you qualify for the waiver. Any discharge of stormwater associated with small construction activity not covered by either a permit or a waiver may be considered an unpermitted discharge under the Clean Water Act. As mentioned above, EPA reserves the right to take enforcement for any unpermitted discharges that occur between the time construction commenced and either discharge authorization is granted or a complete and accurate waiver certification is submitted. EPA may notify any operator covered by a waiver that they must obtain NPDES permit coverage. EPA may notify any operator who has been in non-compliance with a waiver that they may no longer use the waiver for future projects. Any member of the public may petition EPA to take action under this provision by submitting written notice along with supporting justification.

Complete and accurate TMDL or equivalent analysis waiver requests must be sent to the applicable EPA Regional Office address specified in Appendix B.

Appendix D - Eligibility Worksheet Relating to Threatened and Endangered Species Protection

D.1 Introduction

This appendix provides a printable worksheet that can be helpful in selecting and documenting your eligibility criteria with respect to the protection of Federally listed threatened or endangered species and Federally designated "critical habitat" under the Endangered Species Act (ESA) [hereinafter "ESA-listed species and designated critical habitat(s)"] from discharges and discharge-related activities authorized under this permit. This is important because Section 9 of the ESA prohibits all persons and agencies from "taking" threatened and endangered species (16 U.S.C. § 1532(19)).

While coordination between you and the U.S. Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service (NMFS) (together, referred to as the "Services") may not be required in all cases, EPA encourages you to coordinate with the Services, to document that coordination, and to do so early in the planning process prior to submitting your NOI.

D.2 Certifying ESA Eligibility Criterion for the CGP

To be eligible for coverage under the CGP, you must certify that you meet one of the criteria listed in this worksheet (Section D.5), which is then submitted with your NOI for coverage under this permit. If you do not meet one of the ESA eligibility criteria outlined in the worksheet below, you are not eligible for coverage under this permit. These criteria ensure that coverage is available only for discharges and discharge-related activities that (1) avoid or eliminate any short- or long-term adverse effects to ESA-listed species and designated critical habitat(s), or (2) may result in any short- or long-term adverse effects that result in incidental take addressed under the incidental take statement of a biological opinion or permit for take issued under Section 10 of the ESA.

As part of your determination of eligibility, EPA has developed a worksheet that assists operators in arriving at the correct criterion. The following requirements apply to the completion of the worksheet depending on how you are submitting your NOI for permit coverage:

1. If the EPA Regional Office grants you a waiver from electronic reporting, in accordance with Part 1.1.5 of the CGP, you must complete the worksheet in section D.4 of this appendix to provide all information as required on your NOI that supports the eligibility criterion you qualify under per Part 1.1.5 of the permit. **You must submit the worksheet with your NOI. If you do not submit the worksheet with your NOI, your NOI will be considered incomplete.**
2. If you do not have a waiver from electronic reporting, you must **complete your eligibility criteria selection outlined in the Endangered Species Protection section of the NOI in the NPDES eReporting Tool (NeT-CGP)** and provide all information as required on your NOI that supports the eligibility criterion you qualify under per Part 1.1.5 of the permit. The printable worksheet in this appendix may be helpful to you in preparing to submit your NOI, but you do not have to use it.

D.3 What to Expect Once you Submit your NOI

After you submit your NOI and before your NOI is authorized, EPA may notify you if any additional controls are necessary to ensure your discharges are not likely to result in any short- or long-term adverse effects on ESA-listed species and critical habitat.

The Services have the opportunity, within 14 days of submission of the NOI, to advise EPA whether either agency believes the planned discharges meet the selected eligibility criterion; whether the eligibility criterion could be met with additional conditions; or whether the eligibility criterion is not met. With respect to ESA issues, EPA recognizes the Services' expertise and will carefully consider their conclusion(s) in identifying eligibility for authorization, either with or without additional conditions. In the event EPA has placed a hold on your NOI based on NMFS or USFWS' recommendation, EPA will notify you as to whether your discharges are authorized or whether an individual permit will be required. If you do not hear from EPA within 14 days, you may assume that your discharge is authorized without further conditions.

D.4 Worksheet Instructions

Follow the instructions within the worksheet below to determine which criterion you are eligible for coverage under this permit. Check only 1 criterion, answer the required questions, and include the required information.

Please keep the following in mind as you complete the worksheet:

- The worksheet requires that you answer questions in a sequential order so that you can select the correct eligibility criterion. The worksheet does not go through each criterion alphabetically, but rather is organized in a way that allows you to eliminate those criteria that do not apply to your site. For instance, Step 1 of the worksheet requires you to determine whether criterion B, E, or F applies first, in that order, before proceeding to determining whether criterion A applies in Step 2.
- You must consider ESA-listed species and/or designated critical habitat(s) under the jurisdiction of both the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) and select the criterion that best applies to your site. You must comply with any applicable terms, conditions, or other requirements developed in theprocess of meeting one of the eligibility criteria in this section to remain eligible for coverage under this permit.
- When evaluating the potential effects of your activities, you must consider effects to listed species or critical habitats within the "action area" of your construction activity, as identified by the USFWS IPaC and/or the NOAA website resources on page D-10 through D-11 of this appendix. Please Note: *NMFS' jurisdiction includes ESA-listed marine and estuarine species that spawn in inland rivers.* The definition of "action area," which is contained in Appendix A, is repeated below forconvenience.

"Action Area" – all areas to be affected directly or indirectly by the federal action and not merely theimmediate area involved in the action. See 50 CFR part 402. For the purposes of this permit and for application of the Endangered Species Act requirements, the following areas are included in the definition of action area:

- The **areas on the construction site** where stormwater discharges originate and flow toward the point of discharge into the receiving waters. This includes:
  - areas on the construction site where excavation, site development, or other ground disturbance activities occur, and
  - areas where stormwater controls will be constructed and operated, including any areas where stormwater flows to and from the stormwater controls.
- The areas **in the vicinity of the construction site** where stormwater discharges flow from the construction site to one or more points of discharge into receiving waters. (Example: Where stormwater flows into an off-site ditch, swale, or gully that leads to receiving waters.)
- **The extent of the receiving water** potentially affected by stormwater discharges from your construction site through alteration of water chemistry, turbidity, temperature, or bank structure (i.e., erosive flow), regardless of whether the construction site is adjacent to the receiving water.

D.5 Worksheet

Step 1 – Determine if You Meet the Eligibility Requirements of Criterion B, E, or F

Instructions

- First determine whether you are eligible under Criterion B by reviewing the eligibility requirements below.
- If you determine that your facility does not meet Criterion B (e.g., due to difference in action area described, lack of analysis of appropriate effects, new listings or designation of critical habitat), proceed to check if you meet the requirements for Criterion E or F.

Criterion B Eligibility Requirements

If your discharges and discharge-related activities were already addressed in another operator's valid certification of eligibility under the current 2022 CGP that included your action area (e.g., a general contractor or developer may have completed and filed an NOI for the entire action area with the necessary ESA certifications (Criterion A, C, D, E, or F)), you may be eligible under Criterion B. In order to be eligible for coverage, you must confirm that **all** three of the following are true (**check all that apply**):

☐ I have confirmed that the other operator's certification of eligibility accounted for my action area and that the eligibility certification was valid.

☐ There has been no lapse of NPDES permit coverage in the other operator's certification.

☐ I will comply with all measures that formed the basis of the other operator's valid certification of eligibility.

Instructions

- **If all three of the above are true, you may check Criterion B below and answer questions B1-B5, and if applicable, B6-B7.**
- **If any of the above are not true** (for example, if there are any listed species in your action area that were not addressed in the other operator's certification, you are not eligible under Criterion B), **you may not select Criterion B and must proceed to check if you meet the requirements for Criterion E or F.**

☐ **B Eligibility requirements met by another operator under the 2022 CGP.** The construction site's discharges and discharge-related activities were already addressed in another operator's valid certification of eligibility for your "action area" under eligibility Criterion A, C, D, E, or F of the 2022 CGP and you have confirmed that no additional ESA-listed species and/or designated critical habitat under the jurisdiction of USFWS and/or NMFS not considered in the

that certification may be present or located in the "action area." To certify your eligibility under this criterion, there must be no lapse of NPDES permit coverage in the other CGP operator's certification. By certifying eligibility under this criterion, you agree to comply with any conditions upon which the other CGP operator's certification was based. You must include below the NPDES ID from the other 2022 CGP operator's notification of authorization under this permit and list any measures that you must comply with). If your certification is based on another 2022 CGP operator's certification under Criterion C, you must provide EPA with the relevant supporting information required of existing dischargers in Criterion C.

B1. Provide the NPDES ID from the other CGP operator's NOI authorized under this permit:

_ _ _ _ _ _ _ _ _ _

B2. Identify the eligibility criterion of the other CGP operator's NOI? (check only one)

☐ A ☐ C ☐ D ☐ E ☐ F

B3. Provide the authorization date of the other CGP operator's NOI (MM/DD/YYYY):

_ _ / _ _ / _ _ _ _

By certifying eligibility under Criterion B, you must comply with any terms and conditions imposed under the eligibility requirements of the criterion for which the other operator has established eligibility (either Criterion A, C, D, E, or F) to ensure that your discharges and discharge-related activities are protective of listed species and/or critical habitat. *Note: If you are unable to meet these eligibility requirements, then you may either establish eligibility under one of the other criteria, or you may consider applying to EPA for an individual permit.*

B4. List any measures that formed the basis of the other operator's valid certification of eligibility that you will comply with (or enter "N/A" if none exist):

B5. Check to confirm you have provided documentation in your SWPPP supporting your eligibility under Criterion B, including any of the terms and conditions, as well as the other operator's basis for establishing eligibility. Yes ☐

If your certification is based on another operator's certification under Criterion C, you must provide the following:

B6. What Federally listed species and/or designated habitat are located in your "action area"? (attached separate sheet if necessary)

B7. What is the distance between your site and the listed species or designated critical habitat (in miles)? _____

Instructions

- **If you selected Criterion B above and answered questions B1-B5, and if applicable, B6-B7, you are done with this worksheet. If you are *not* filing electronically, you must submit this worksheet with your NOI.**

- If you are not eligible under Criterion B, proceed to check if you meet the requirements for Criterion E or F. Note that for projects located in Lands of Exclusive Federal Jurisdiction carried by or on behalf of a Federal agency, your options are limited to selecting Criterion E.

Criterion E Eligibility Requirements

If consultation under ESA section 7 has concluded, you may be eligible for coverage under Criterion E. In order to be eligible for coverage under Criterion E, **you must confirm that both of the following are true (check all that apply)**:

☐ A consultation between a Federal agency and USFWS and/or the NMFS under section 7 of the ESA has concluded**.** Consultations can be either formal or informal, and would have occurred only as a result of a separate Federal action (e.g., during application for an individual wastewater discharge permit or the issuance of a wetlands dredge and fill permit), and the consultation must have addressed the effects of your construction activity's discharges and discharge-related activities on all ESA-listed threatened or endangered species and all designated critical habitat under the jurisdiction of each Service, as appropriate, in your action area. The result of this consultation must be either:

i. A biological opinion currently in effect that determined that the action in question (taking into account the effects of your facility's discharges and discharge-related activities) is likely to adversely affect, but is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. The biological opinion must have included the effects of your facility's discharges[1] and discharge-related activities on all the listed species and designated

[1] Effects of discharge include, but are not limited to, the analysis of the hydrological, chemical, and biological effects of the discharge on listed species, their prey, and their habitat, as well as critical habitat, where designated. For example, the

critical habitat in your action area under the jurisdiction of each Service, as appropriate. To be eligible under (i), any reasonable and prudent measures specified in the incidental take statement must be implemented;

ii. Written concurrence (e.g., letter of concurrence) from the applicable Service(s) with a determination that your facility's discharges and discharge-related activities are not likely to adversely affect ESA-listed species and/or designated critical habitat. The concurrence letter must have included the effects of your facility's discharges and discharge-related activities on all the ESA-listed species and/or designated critical habitat on your species list(s) acquired from USFWS and/or NMFS as part of this worksheet.

☐ The consultation does not warrant reinitiation under 50 CFR §402.16; or, if reinitiation of consultation is required (e.g., due to a new species listing, critical habitat designation, or new information), the Federal action agency has reinitiated the consultation and the result of the consultation is consistent with the statements above. Include any reinitiation documentation from the Services or consulting Federal agency with your NOI.

Instructions

- **If both of the above are true, you may check Criterion E below and answer questions E1-E6.**
  - For more information on section 7 consultation, see 50 CFR part 402. If you receive a "jeopardy opinion," you may continue to work with USFWS and/or NMFS and your permitting authority to modify your project so that it will not jeopardize listed species or designated critical habitat.
  - Note that most consultations are accomplished through informal consultation. When conducting informal ESA section 7 consultation as a non-Federal representative, you must follow the procedures found in 50 CFR Part 402 of the ESA regulations. You must notify the Services of your intention and agreement to conduct consultation as a non-Federal representative.
  - Consultation may also occur in the context of another Federal action at the construction site (e.g., where ESA section 7 consultation was performed for issuance of a wetlands dredge and fill permit for the project or where a NEPA review is performed for the project that incorporates a section 7 consultation).
  - Any terms and conditions developed through consultations to protect listed species and critical habitat must be incorporated into the SWPPP. As noted above, a Federal operator may, if they wish, initiate consultation with the Services at Step Four. Non-Federal operators may seek technical assistance from the Services at Step 5.
  - Whether ESA section 7 consultation must be performed with either USFWS, NMFS, or both Services depends on the listed species that may be affected by the operator's stormwater discharges. In general, NMFS has jurisdiction over marine, estuarine, and anadromous species. Operators should also be aware that while formal section 7 consultation provides protection from incidental takings liability, informal consultation does not.

- **If not, proceed to check if you meet the requirements for Criterion F.**

effects analysis would have evaluated whether the various pollutants in the discharge (e.g., TSS, metals) would adversely affect listed species through exposure to the pollutants, or to their prey or habitat. Effects that look only at short-term effects unrelated to the stormwater discharge effects to listed species are not sufficient for these purposes.

☐ **E** **ESA Section 7 consultation has successfully concluded.** Consultation between a Federal Agency and the USFWS and/or NMFS under section 7 of the ESA has concluded. The consultation must have addressed the effects of the construction site's discharges and discharge-related activities on ESA-listed species and/or designated critical habitat under the jurisdiction of USFWS and/or NMFS. To certify eligibility under this criterion, **Indicate the result of the consultation**:

☐ Biological opinion and/or conference opinion and incidental take statement currently in effect currently in effect from USFWS and/or NMFS that concludes that the action in question (taking into account the effects of your site's discharges and discharge-related activities) is not likely to jeopardize the continued existence of ESA-listed species, nor the destruction or adverse modification of critical habitat;

Or

☐ Written concurrence from USFWS and/or NMFS with a finding that the site's discharges and discharge-related activities are not likely to adversely affect ESA-listed species and/or designated critical habitat.

E1. Identify the federal action agency or agencies involved:

E2. Identify the Service(s) field or regional offices providing the consultation:

E3. Identify any tracking numbers associated with the consultation (e.g., IPaC number, ECO number):

E4. What is the date the consultation was completed? (MM/DD/YYYY) __ __ / __ __ / __ __ __ __

E5. Check to confirm that correspondence with USFWS and/or NMFS documenting the Biological Opinion, conference opinion (IPaC or ECO tracking number) or concurrence is attached. Yes ☐

E6. Check to confirm you have provided documentation in your SWPPP supporting your eligibility under Criterion E, including copies of the correspondence between yourself and the Services. Yes ☐

Instructions

- **If you selected Criterion E above and answered questions E1-E6, you are done with this worksheet. If you are not filing electronically, you must submit this worksheet with your NOI.**
- If you are not eligible under Criterion E, proceed to check if you meet the requirements for Criterion F.

Criterion F Eligibility Requirements

If your construction activities are the subject of a permit under ESA section 10, and this authorization addresses the effects of your site's discharges and discharge-related activities on ESA-listed species and designated critical habitat in your action area, you may be eligible for coverage under Criterion F. In order to be eligible or coverage under Criterion F, **you must confirm that the following is true:**

☐ A permit or permits issued under section 10 of the ESA specifically address the effects of your facility's discharges and discharge-related activities (if applicable) on all federally-listed species and designated critical habitat in your action area.

Note: You must follow USFWS and/or NMFS procedures when applying for an ESA section 10 permit (see 50 CFR §17.22(b)(1) for USFWS and §222.22 for NMFS). Application instructions for section 10 permits can be obtained from http://www.fws.gov and http://www.nmfs.noaa.gov or by contacting the appropriate Service office.

Instructions

- **If the above is true, you may check Criterion F below and answer questions F1-F6.**
- If you are not eligible under criterion F, proceed to Step 2.

☐ **F** **Issuance of section 10 permit**. Potential take is authorized through the issuance of a permit under section 10 of the ESA by the USFWS and/or NMFS, and this authorization addresses the effects of the site's discharges and discharge-related activities on ESA-listed species and designated critical habitat. You must include copies of the correspondence between yourself and the participating agencies in your SWPPP and your NOI.

F1. Which Service provided the section 10 permit? (check all that apply)

USFWS ☐ NMFS ☐

F2. Identify the field or regional offices providing the permit(s):

F3. Identify any tracking numbers associated with the consultation (e.g., IPaC number, ECO number):

F4. What is the date the permit(s) was granted? (MM/DD/YYY) __ __ / __ __ / __ __ __ __
(2nd permit date, if applicable: __ __ / __ __ / __ __ __ __)

F5. Check to confirm that correspondence with USFWS and/or NMFS and a copy of the section 10 permit or relevant tracking number(s) (IPaC and/or ECO number) is attached. Yes ☐

F6. Check to confirm you have provided documentation in your SWPPP supporting your eligibility under Criterion F, including a copy of the section 10 permit and copies of the correspondence between yourself and the Services. Yes ☐

Instructions

- **If you selected Criterion F above and answered questions F1-F6, you are done with this worksheet. If you are not filing electronically, you must submit this worksheet with your NOI.**
- If you are not eligible under Criterion F, proceed to Step 2.

Step 2 – Determine if Listed Threatened or Endangered Species or their Designated Critical Habitat(s) are Likely to Occur in your Site's Action Area

Instructions

- **First, determine the extent of your action area.** You must determine whether species listed as either threatened or endangered, or their critical habitat(s) are located in your site's action area (i.e., all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action, including areas beyond the footprint of the site that are likely to be affected by stormwater discharges, discharge-related activities, and authorized non-stormwater discharges).

You must consider the following in determining the action area for your site, and **confirm that all the following are true**:

☐ In determining my "action area", I have considered that discharges of pollutants from the project site can expand the action area well beyond the footprint of my site and the discharge point(s). I have taken into account the controls I will be implementing to minimize pollutants and the receiving waterbody characteristics (e.g., perennial, intermittent, ephemeral) in determining the extent of physical, chemical, and/or biotic effects of the

discharges. I confirm that all receiving waterbodies that could receive pollutants from my site are included in my action area.

☐ In determining my "action area", I have considered that discharge-related activities must also be accounted for in determining my action area. I understand that discharge-related activities are any activities that cause, contribute to, or result in stormwater and authorized non-stormwater point source discharges, and measures such as the siting, construction, timing,[2] and operation of stormwater controls to control, reduce, or prevent pollutants from being discharged. I understand that any new or modified stormwater controls that will have noise or other similar effects, and any disturbances associated with construction of controls, are part of my action area.

If you have any questions about determining the extent of your action area, you may contact EPA or the Services for assistance. https://www.epa.gov/npdes/contact-us-stormwater#regional

Instructions

- **Next, you must identify, to the best of your ability, any species listed as either threatened or endangered, or their critical habitat(s), that are located in your site's action area (see definitions of these terms in Appendix A).** You must follow the instructions on the https://www.epa.gov/npdes/construction-general-permit-threatened-and-endangered-species to obtain lists of any ESA-protected species and/or critical habitat that are expected to exist in your county, township, or the receiving water for your discharge.
- If ESA-protected resources occur within your action area, keep a copy of the species and critical habitat list(s) from the Service(s) with your SWPPP and use the list(s) to complete your NOI. For USFWS species, attach to this worksheet the full printout from your IPaC query/Official Species List. You can include the map from your IPaC query. For NMFS species, attach to this worksheet the full printout of the report from your query of the mapping resource you used (either the National or Greater Atlantic Region Mapper). The printed report from NMFS mappers will include a map of your query.

[2] Timing considerations could be related to, for example, a time of the year where a migratory bird species is present in the action area and the operator might want to consider that in terms of their construction sequencing; there are other times of the year where this consideration might not be relevant.

Instructions

- **After completing Step 2 above, if there are <u>no</u> listed species and <u>no</u> critical habitat areas in your action area,** you may be eligible for criterion A.

Criterion A Eligibility Requirements

In order to be eligible for coverage under criterion A, you must confirm that all the following are true (**check all that apply**):

☐ I confirm that I have used the species location resources of **BOTH** NMFS and USFWS to identify any ESA-listed species within my action area.

☐ I have confirmed there to be no ESA-listed species and no critical habitat in my action area.

Instructions

- **If all of the above are true, you may check criterion A below and answer questions A1-A5.**
- **If any of the above is not true, you may not select criterion A and must proceed to Step 3** to determine if you can become eligible under criterion C.

Note: For existing dischargers that have previously obtained coverage under criterion A, you must verify whether ESA-protected species and/or critical habitat are expected to exist in your action area, as described above. Please note that if you now find that your action area overlaps with ESA-protected species or critical habitat, you must proceed to Step 3.

☐ **A <u>No ESA-listed species and/or designated critical habitat present in action area</u>**. You certify that ESA-listed species and designated critical habitat(s) under the jurisdiction of the USFWS or NMFS are not likely to occur in your site's "action area" as defined in Appendix A of this permit.. *Please Note: NMFS' jurisdiction includes ESA-listed marine and estuarine species that spawn in inland rivers.*

A1. USFWS information sources used (reliance on State resources is not acceptable):

Note: If your Official Species List from USFWS indicated no species or critical habitat were present in your action area, include the full consultation tracking code at the top of your Official Species List in your NOI in the basis statement for Criterion A. If an Official Species List was not available on IPaC, list the contact date and name of the Service staff with whom you corresponded to verify no USFWS species or critical habitat were present in your action area.

A2. NMFS information sources used (reliance on State resources is not acceptable):

A3. I confirm that aerial image(s) of the site is attached. Yes ☐

A4. I confirm that a printout of the species' list(s) showing no ESA-listed species or critical habitat in my action area is attached. Yes ☐

A5. Check to confirm you have provided documentation in your SWPPP supporting your eligibility under Criterion A. For USFWS species, include the full printout from your IPaC query/Official Species List. You can include the map from your IPaC query. For NMFS species, include the full printout from the appropriate NMFS website resources on page X with the correct Region selected. Yes ☐

Instructions

- **If you selected Criterion A above and answered questions A1-A5, you are done with this worksheet. If you are not filing electronically, you must submit this worksheet with your NOI.**

- **If listed species and/or critical habitat may exist in your action area, you must do one or more of the following**:

  - **Conduct visual inspections.** This method may be particularly suitable for construction sites that are smaller in size or located in non-natural settings such as highly urbanized areas or industrial parks where there is little or no natural habitat, or for construction activities that discharge directly into municipal stormwater collection systems.
  - **Conduct a formal biological survey**. In some cases, particularly for larger construction sites with extensive stormwater discharges, biological surveys may be an appropriate way to assess whether species are located in the action area and whether there are likely to be short- or long-term adverse effects to such species. Biological surveys are frequently performed by environmental consulting firms.
  - **If required, conduct an environmental assessment under the National Environmental Policy Act (NEPA).** Some construction activities might require review under NEPA for specific reasons, such as Federal funding or other Federal involvement in the project. Note: Coverage under the CGP does not trigger such a review for individual projects/sites. EPA has complied with NEPA in the issuance of the CGP.

    and

  - **Follow the instructions in Steps 3 – 5 below, as applicable.** Note that many but not all measures imposed to protect listed species under these steps will also protect critical habitat. Thus, meeting the eligibility requirements of this CGP may require measures to protect critical habitat that are separate from those to protect listed species.

Step 3 – Assess if the Construction Activity's Discharges or Discharge-Related Activities Are Likely to Result in Short- or Long-Term Adverse Effects to Listed Threatened or Endangered Species or Designated Critical Habitat

Instructions

- If in Step 2 you identified that listed species and/or designated critical habitat could exist in your action area, **you must next assess whether your discharges or discharge-related activities are likely to result in short- or long-term adverse effects to ESA-listed threatened or endangered species or designated critical habitat**.

Potential short- or long-term adverse effects from discharges and discharge-related activities include:

- **Hydrological**. Stormwater discharges may cause siltation, sedimentation, or induce other changes in receiving waters such as temperature, salinity, or pH. These effects will vary with the amount of stormwater discharged and the volume and condition of the receiving water. Where a stormwater discharge constitutes a minute portion of the total volume of the receiving water, adverse hydrological effects are less likely. Construction activity itself may also alter drainage patterns on a site where construction occurs that can impact listed species or critical habitat.
- **Habitat**. Excavation, site development, grading, and other surface disturbance activities from construction activities, including the installation or placement of stormwater controls, may result in adverse effects to listed species or their habitat. Stormwater may drain or inundate listed species habitat.
- **Toxicity**. In some cases, pollutants in construction stormwater may have toxic effects on listed species. For example: Stormwater discharges from construction on or adjacent to agricultural property may contain pesticides. Stormwater discharges from projects involving pavement and roofing could include tar and asphalt.

The scope of effects to consider will vary with each site. If you are having difficulty determining whether your project is likely to result in short- or long-term adverse effects to listed species or critical habitat, or one of the Services has already raised concerns to you, you should contact the appropriate Services office for assistance.

Instructions

- **If any short- or long-term adverse effects to listed threatened or endangered species or their critical habitat <u>are not</u> likely, then you may check Criterion C below and answer questions C1-C8.**
- **If any short- or long-term adverse effects to listed threatened or endangered species or their critical habitat <u>are</u> likely, you must follow Step 4 below.** You may still be eligible for Criterion C if you are able to install and implement appropriate measures to avoid the likelihood of adverse effects.

Criterion C Eligibility Requirements

☐ **C** **Discharges not likely to result in any short- or long-term adverse effects to ESA-listed species and/or designated critical habitat.** ESA-listed species and/or designated critical habitat(s) under the jurisdiction of the USFWS and/or NMFS are likely to occur in or near your site's "action area," and you certify to EPA that your site's discharges and discharge-related activities are not likely to result in any short- or long-term adverse effects to ESA-listed threatened or endangered species and/or designated critical habitat. This certification may include consideration of any stormwater controls and/or management practices you will adopt to ensure that your discharges and discharge-related activities are not likely to result in any short- or long-term adverse effects to ESA-listed species and/or designated critical habitat. To certify your eligibility under this criterion, you must indicate below1) the ESA-listed species and/or designated habitat located in your "action area" using the process outlined in this Appendix; 2) the distance between the site and the listed species and/or designated critical habitat in the action area (in miles); and 3) a rationale describing specifically how short- or long-term adverse effects to ESA-listed species will be avoided from the discharges and discharge-related activities. You must also include a copy of your site map from your SWPPP showing the upland and in-water extent of your "action area" with your NOI.

C1. I confirm that both ESA-listed species and designated critical habitat under the jurisdiction of the USFWS and/or NMFS were considered in my evaluation. Yes ☐

C2. Provide the USFWS information resources and expertise used to arrive at this criterion selection:

C3. Provide the NMFS information resources and expertise used to arrive at this criterion selection:

C4. What ESA-listed species and/or designated critical habitat are located in your "action area?" (or attach a printout of the species' list(s))

C5. What is the distance between your site and the ESA-listed species and/or designated critical habitat within the action area (in miles, state "on site" if the ESA-listed species and/or designated critical habitat is within the area to be disturbed)? _____

C6. Provide the rationale describing specifically how any short- or long-term adverse effects to ESA-listed species will be avoided from the discharge and discharge-related activities.

C7. I confirm that a site map from my SWPPP showing the upland and in-water extent of my "action area" is attached. Yes ☐

C8. Check to confirm you have provided documentation in your SWPPP supporting your eligibility under Criterion C. Yes ☐

Instructions

- **If you selected Criterion C above and answered questions C1-C8, you are done with this worksheet. If you are not filing electronically, you must submit this worksheet with your NOI.**

- If not, please proceed to step 4.

Step 4 - Determine if Measures Can Be Implemented to Avoid Adverse Effects

Instructions

If you make a preliminary decision in Step 3 that short- or long-term adverse effects from your construction activity's discharges or discharge-related activities are likely to occur, you can still receive coverage under eligibility Criterion C of the CGP if appropriate measures are undertaken to avoid or eliminate the likelihood of short- or long-term adverse effects prior to applying for CGP coverage.

These measures may involve relatively simple changes to construction activities such as re-routing a stormwater discharge to bypass an area where species are located, relocating stormwater controls, or by modifying the "footprint" of the construction activity. If you are unable to ascertain which measures to implement to avoid the likelihood of short- or long-term adverse effects, you must coordinate with USFWS and/or NMFS, in which case you would not be eligible for coverage under eligibility Criterion C, but may instead be eligible for coverage under eligibility criterion D (described in more detail in Step 5).

- **If you are able to install and implement appropriate measures to avoid the likelihood of short- or long-term adverse effects, then <u>you</u> <u>may go back</u> and check eligibility Criterion C above and answer questions C1-C8 above, <u>and</u> C9-C10 below.** The measures you adopt to avoid or eliminate short- or long-term adverse effects must be implemented for the duration of the construction project and your coverage under the CGP.
- **If you cannot ascertain which measures to implement to avoid the likelihood of adverse effects,** you must follow the procedures in Step 5.

C9. I confirm that I have or will install and implement appropriate measures to avoid the likelihood of any short- or long-term adverse effects to ESA-listed threatened or endangered species or their critical habitat. Yes ☐

C10. Provide a description of the measures installed/to be installed and implemented to avoid likelihood of any short- or long-term adverse effects.

Instructions

- **If you selected Criterion C above and answered questions C1-C10, you are done with this worksheet. If you are not filing you NOI electronically, you must submit this worksheet with your NOI.**
- If you are not eligible for Criterion C, please proceed to step 5.

Step 5 - Determine if the Eligibility Requirements of Criterion D Can Be Met

Instructions

- If in Step 4 you cannot ascertain which measures to implement to avoid the likelihood of short- or long-term adverse effects, you must contact USFWS and/or NMFS. You may still be eligible for CGP coverage if likely adverse effects can be addressed through meeting criterion D.
- If you meet the requirements of criterion D, **then you may check criterion D below and answer questions D1-D5.**

Criterion D Eligibility Requirements

☐ **D** **Coordination with USFWS and/or NMFS has successfully concluded.** Coordination between you and the USFWS and/or NMFS has concluded. The coordination must have addressed the effects of your site's discharges and discharge-related activities on ESA-listed species and/or designated critical habitat under the jurisdiction of USFWS and/or NMFS, and resulted in a written confirmation from USFWS and/or NMFS that the effects of your site's discharges and discharge-related activities are not likely to result in short- or long-term adverse effects for ESA-listed species and/or designated critical habitat in your action area. By certifying eligibility under this criterion, you agree to comply with any conditions you must meet for your site's discharges and discharge-related activities to not likely result in any short- or long-term adverse effects. You must include copies of the correspondence with the participating agencies in your SWPPP and your NOI.

D1. Which Service participated in coordination? (check all that apply) USFWS ☐ NMFS ☐

D2. Identify the field and/or regional office(s) that provided the coordination?

D3. What is the date the coordination concluded? (MM/DD/YYY) __ __ / __ __ / __ __ __ __

D4. Check to confirm that correspondence with USFWS and/or NMFS documenting concurrence is attached. Yes ☐

D5. Check to confirm you have provided documentation in your SWPPP supporting your eligibility under Criterion D, including copies of the correspondence between yourself and the Services. Yes ☐

Instructions

- **If you selected Criterion D above and answered questions D1-D5, you are done with this worksheet. If you are not filing electronically, you must submit this worksheet with your NOI.**

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Appendix E – Historic Property Screening Process

Background

Section 106 of the National Historic Preservation Act (NHPA) requires Federal agencies to take into account the effects of Federal "undertakings", such as the issuance of this permit, on historic properties that are either listed on, or eligible for listing on, the National Register of Historic Places. To address any issues relating to historic properties in connection with the issuance of this permit, EPA developed the screening process in this appendix that enables construction operators to appropriately consider the potential impacts, if any, of their installation of stormwater controls on historic properties and to determine whether actions can be taken, if applicable, to mitigate any such impacts. Although the coverages of individual construction sites under this permit do not constitute separate Federal undertakings, the screening process in this appendix provides an appropriate site-specific means of addressing historic property issues in connection with EPA's issuance of the permit.

Key Terms

Historic property- prehistoric or historic districts, sites, buildings, structures, or objects that are included in or eligible for inclusion in the National Register of Historic Places, including artifacts, records, and remains that are related to and located within such properties

SHPO – The State Historic Preservation Officer for a particular State

THPO or Tribal representative – The Tribal Historic Preservation Officer for a particular Tribe or, if there is no THPO, the representative designated by such Tribe for NHPA purposes

Instructions for All Construction Operators

You are required to follow the screening process in this appendix to determine if your installation of stormwater controls on your site has the potential to cause effects to historic properties, and whether or not you need to contact your SHPO, THPO, or other Tribal representative for further information. **You may not submit your NOI until you have completed this screening process.** The following four steps describe how applicants can meet the historic property requirements under this permit:

Step 1 *Are you installing any stormwater controls that require subsurface earth disturbance?*[1]

The first step of the screening process is to determine if you will install stormwater controls that cause subsurface earth disturbance. The installation of the following types of stormwater controls require subsurface earth disturbance:[2]

- Dikes
- Berms
- Catch Basins
- Ponds
- Ditches
- Trenches
- Culverts
- Channels

[1] You are only required to consider earth-disturbing activities related to the installation of stormwater controls in the NHPA screening process. You are not reqired to consider other earth-disturbing activities at the site. If you are installing one of the above stormwater controls or another type of control that requires subsurface earth disturbance, your stormwater controls have the potential to have an effect on historic properties. If this is the case, then you must proceed to Step 2.

[2] This list is not intended to be exhaustive. Other stormwater controls that are not on this list may involve earth-disturbing activities and must also be examined for the potential to affect historic properties.

- Perimeter Drains
- Swales

If you are not installing one of the above stormwater controls or another type of control that requires subsurface earth disturbance, then you may indicate this on your NOI, and no further screening is necessary. During the 14-day waiting period after submitting your NOI, the SHPO, THPO, or other Tribal representative may request that EPA hold up authorization based on concerns about potential adverse effects to historic properties. EPA will evaluate any such request and notify you if any additional controls to address adverse effects to historic properties are necessary.

Step 2 *Have prior professional cultural resource surveys or other evaluations determined that historic properties do not exist, or have prior disturbances precluded the existence of historic properties?*

If you are installing a stormwater control that requires subsurface earth disturbance, you must next determine if no historic properties exist on your site based on prior professional cultural resource surveys or other evaluations, or if the existence of historic properties has been precluded because of prior earth disturbances.

If prior to your project it has already been determined that no historic properties exist at your site based on available information, including information that may be provided by your applicable SHPO, THPO, or other Tribal representative, then you may indicate this on your NOI, and no further screening steps are necessary. Similarly, if prior earth disturbances have eliminated the possibility that historic properties exist on your site, you may indicate this on your NOI, and no further screening steps are necessary. After submitting your NOI, and during the 14-day waiting period, the SHPO, THPO, or other Tribal representative may request that EPA hold up authorization based on concerns about potential adverse effects to historic properties. EPA will evaluate any such request and notify you if any additional measures to address adverse effects to historic properties are necessary.

If neither of these circumstances exists for your project, you must proceed to Step 3.

Step 3 *If you are installing any stormwater controls that require subsurface earth disturbance, you must determine if these activities will have an effect on historic properties.*

If your answer to the question in Step 2 is "no", then you must assess whether your earth-disturbing activities related to the installation of stormwater controls will have an effect on historic properties. This assessment may be based on historical sources, knowledge of the area, an assessment of the types of earth-disturbing activities you are engaging in, considerations of any controls and/or management practices you will adopt to ensure that your stormwater control-related earth-disturbing activities will not have an effect on historic properties, and any other relevant factors. If you determine based on this assessment that earth disturbances related to the installation of your stormwater controls will have no effect on historic properties, you may indicate this on your NOI, and document the basis for your determination in your SWPPP, and no further screening steps are necessary. After submitting your NOI, and during the 14-day waiting period, the SHPO, THPO, or other Tribal representative may request that EPA hold up authorization based on concerns about potential adverse effects to historic properties. EPA will evaluate any such request and notify you if any further processes are necessary including any additional measures to address adverse effects to historic properties are necessary.

If none of the circumstances in Steps 1 - 3 exist for your project, you must proceed to Step 4.

Step 4: *If you are installing any stormwater controls that require subsurface earth disturbance and you have not satisfied the conditions in Steps 1 - 3, you must contact and consult with the appropriate historic preservation authorities.*

Where you are installing stormwater controls that require subsurface earth disturbance, and you cannot determine in Step 3 that these activities will have no effect on historic properties, then you must contact the relevant SHPO, THPO, or other Tribal representative to request their views as to the likelihood that historic properties are potentially present on your site and may be impacted by the installation of these controls.

> *Note: Addresses for SHPOs may be found at https://ncshpo.org/directory/, and addresses for THPOs may be found at https://grantsdev.cr.nps.gov/THPO_Review/index.cfm. If a Tribe does not have a THPO, you should contact the appropriate Tribal government office designated by the Tribe for this purpose.*

You must submit the following minimum information in order to properly initiate your request for information:

1. Project name (*i.e.*, the name or title most commonly associated with your project);
2. A narrative description of the project;
3. Name, address, phone and fax number, and email address (if available) of the operator;
4. Most recent U.S. Geological Survey (USGS) map section (7.5 minute quadrangle) showing actual project location and boundaries clearly indicated; and
5. Sections of the SWPPP site map (see Part 7.2.4) that show locations where stormwater controls that will cause subsurface earth disturbance will be installed (see Step 1).

Without submitting this minimum information, you will not have been considered to have properly initiated your request. You will need to provide the SHPO, THPO, or other Tribal representative **a minimum of 15 calendar days** after they receive these materials to respond to your request for information about your project.

If you do not receive a response within 15 calendar days after receipt by the SHPO, THPO, or other Tribal representative of your request, then you may indicate this on your NOI, and no further screening steps are necessary. Or, if the applicable SHPO, THPO, or other Tribal representative responds to your request with an indication that no historic properties will be affected by the installation of stormwater controls at your site, then you may indicate this on your NOI, and no further screening steps are necessary. After submitting your NOI, and during the 14-day waiting period, the SHPO, THPO, or other Tribal representative may request that EPA hold up authorization based on concerns about potential adverse effects to historic properties. EPA will evaluate any such request and notify you if any further processes are necessary including any additional measures to address adverse effects to historic properties are necessary.

If within 15 calendar days of receipt of your request the applicable SHPO, THPO, or other Tribal representative responds with a request for additional information or for further consultation regarding appropriate measures for treatment or mitigation of effects on historic properties caused by the installation of stormwater controls on your site, you must comply with this request and proceed to Step 5.

Step 5: *Consultation with applicable consulting parties.*

If, following your discussions with the appropriate historic preservation authorities in Step 4, the applicable SHPO, THPO, Tribal representative, or any other consulting party requests additional information or further consultation, you must respond with such information or consult to determine impacts to historic properties that may be caused by the installation of stormwater controls on your site and appropriate measures for treatment or mitigation of such impacts. If as a result of your discussions with the applicable SHPO, THPO, Tribal representative, or any other

consulting party, you enter into, and comply with, a written agreement regarding treatment and/or mitigation of impacts on your site, then you may indicate this on your NOI, and no further screening steps are necessary.

If, however, agreement on an appropriate treatment or mitigation plan cannot be reached between you and the SHPO, THPO, Tribal representative, or any other consulting party within 30 days of your response to the SHPO, THPO, Tribal representative, or any other consulting party's request for additional information or further consultation, you may submit your NOI, but you must indicate that you have not negotiated measures to avoid or mitigate such effects. You must also include in your SWPPP the following documentation:

1. Copies of any written correspondence between you and the SHPO, THPO, Tribal representative, or any other consulting party; and
2. A description of any significant remaining disagreements as to mitigation measures between you and the SHPO, THPO, Tribal representative, or any other consulting party.

After submitting your NOI, and during the 14-day waiting period, the SHPO, THPO, ACHP, Tribal representative, or any other consulting party may request that EPA place a hold on authorization based upon concerns regarding potential adverse effects to historic properties. EPA, in coordination with the ACHP, will evaluate any such request and notify you if any further processes are necessary including any additional measures to address adverse effects to historic properties are necessary.

Appendix F – Buffer Requirements.

The purpose of this appendix is to assist you in complying with the requirements in Part 2.2.1 of the permit regarding the establishment of natural buffers and/or equivalent sediment controls. This appendix is organized as follows:

F.1 SITES THAT ARE REQUIRED TO PROVIDE AND MAINTAIN NATURAL BUFFERS AND/OR EQUIVALENT EROSION AND SEDIMENT CONTROLS 2
F.2 COMPLIANCE ALTERNATIVES AND EXCEPTIONS 3
F.2.1 Compliance Alternatives 3
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F.1 SITES THAT ARE REQUIRED TO PROVIDE AND MAINTAIN NATURAL BUFFERS AND/OR EQUIVALENT EROSION AND SEDIMENT CONTROLS

The requirement in Part 2.2.1 to provide and maintain natural buffers and/or equivalent erosion and sediment controls applies for any discharges to waters of the U.S. located within 50 feet of your site's earth disturbances. If the receiving water is not located within 50 feet of earth-disturbing activities, Part 2.2.1 does not apply. See Figure F – 1.

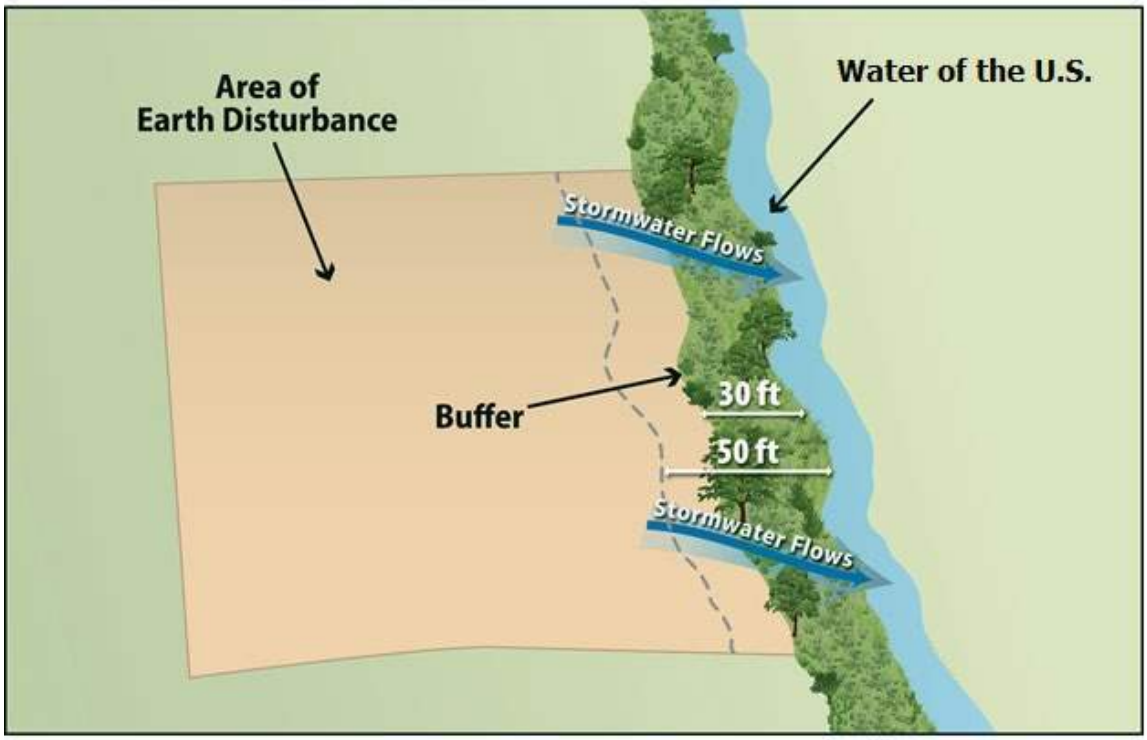


Figure F-1 Example of earth-disturbing activities within 50 feet of a water of the U.S.

F.2 COMPLIANCE ALTERNATIVES AND EXCEPTIONS

F.2.1 Compliance Alternatives

If Part 2.2.1 applies to your site, you have three compliance alternatives from which you can choose, unless you qualify for any of the exceptions (see below and Part 2.2.1.a):

1. Provide and maintain a 50-foot undisturbed natural buffer; or
2. Provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer; or
3. If infeasible to provide and maintain an undisturbed natural buffer of any size, implement erosion and sediment controls to achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.

The compliance alternative selected must be maintained throughout the duration of permit coverage.

See Part F.2.2 below for exceptions to the compliance alternatives.

See Part F.2.3 for requirements applicable to providing and maintaining natural buffers under compliance alternatives 1 and 2 above.

See Part F.2.4 for requirements applicable to providing erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer under compliance alternatives 2 and 3 above.

F.2.2 Exceptions to the Compliance Alternatives

The following exceptions apply to the requirement to implement one of the Part 2.2.1.a compliance alternatives (see also Part 2.2.1.b):

- The following disturbances are exempt from the requirements Part 2.2.1 and this Appendix[1]:
  - Construction approved under a CWA Section 404 permit; or
  - Construction of a water-dependent structure or water access areas *(e.g., pier, boat ramp, trail)*.
- If there is no discharge of stormwater to waters of the U.S. through the area between the disturbed portions of the site and any waters of the U.S. located within 50 feet of your site, you are not required to comply with the requirements in Part 2.2.1 and this Appendix. This includes situations where you have implemented controls measures, such as a berm or other barrier, that will prevent such discharges.
- Where no natural buffer exists due to preexisting development disturbances *(e.g., structures, impervious surfaces)* that occurred prior to the initiation of planning for the current development of the site, you are not required to comply with the requirements in Part 2.2.1 and this Appendix.
  Where some natural buffer exists but portions of the area within 50 feet of the receiving water are occupied by preexisting development disturbances, you are

[1] This exemption does not apply, however, to disturbances within 50 feet of a receiving water that are adjacent to the disturbances listed here (i.e., construction permitted under CWA Section 404, or construction of a water-dependent structure or water access area) and that are covered by this permit.

required to comply with the requirements in Part 2.2.1 and this Appendix. For the purposes of calculating the sediment load reduction for either compliance alternative 2 or 3, you are not expected to compensate for the reduction in buffer function that would have resulted from the area covered by these preexisting disturbances. Clarity about how to implement the compliance alternatives for these situations is provided in F.2.3 and F.2.4 below.

If during your project, you will disturb any portion of these preexisting disturbances, the area removed will be deducted from the area treated as a "natural buffer."

- For "linear construction sites" (see Appendix A), you are not required to comply with this requirement if site constraints *(e.g., limited right-of-way)* make it infeasible to implement one of the Part 2.2.1.a compliance alternatives, provided that, to the extent feasible, you limit disturbances within 50 feet of any waters of the U.S. and/or you provide supplemental erosion and sediment controls to treat stormwater discharges from earth disturbances within 50 feet of the receiving water You must also document in your SWPPP your rationale for why it is infeasible for you to implement one of the Part 2.2.1.a compliance alternatives, and describe any buffer width retained and supplemental erosion and sediment controls installed.
- For "small residential lot" construction *(i.e., a lot being developed for residential purposes that will disturb less than 1 acre of land, but is part of a larger residential project that will ultimately disturb greater than or equal to 1 acre),* you have the option of complying with one of the "small residential lot" compliance alternatives in Part F.3 of this appendix.

Note that you must document in your SWPPP if any disturbances related to any of the above exceptions occurs within the buffer area on your site.

F.2.3 Requirements for Providing and Maintaining Natural Buffers

This part of the appendix applies to you if you choose compliance alternative 1 (50-foot buffer), compliance alternative 2 (a buffer of < 50 feet supplemented by additional erosion and sediment controls that achieve the equivalent sediment load reduction as the 50-foot buffer), or if you are providing a buffer in compliance with one of the "small residential lot" compliance alternatives in Part F.3.

Buffer Width Measurement

Where you are retaining a buffer of any size, the buffer should be measured perpendicularly from any of the following points, whichever is further landward from the water:

1. The ordinary high water mark of the water body, defined as the line on the shore established by fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, and/or the presence of litter and debris; or
2. The edge of the stream or river bank, bluff, or cliff, whichever is applicable.

Refer to Figures F – 2 and F - 3. You may find that specifically measuring these points is challenging if the flow path of the receiving water changes frequently, thereby causing the measurement line for the buffer to fluctuate continuously along the path of the waterbody. Where this is the case, EPA suggests that rather than measuring each change or deviation along the water's edge, it may be easier to select regular intervals

from which to conduct your measurement. For instance, you may elect to conduct your buffer measurement every 5 to 10 feet along the length of the water.

Additionally, note that if earth-disturbing activities will take place on both sides of a receiving water that flows through your site, to the extent that you are establishing a buffer around this water, it must be established on both sides. For example, if you choose compliance alternative 1, and your project calls for disturbances on both sides of a small stream, you would need to retain the full 50 feet of buffer on both sides of the water. However, if your construction activities will only occur on one side of the stream, you would only need to retain the 50-foot buffer on the side of the stream where the earth-disturbance will occur.

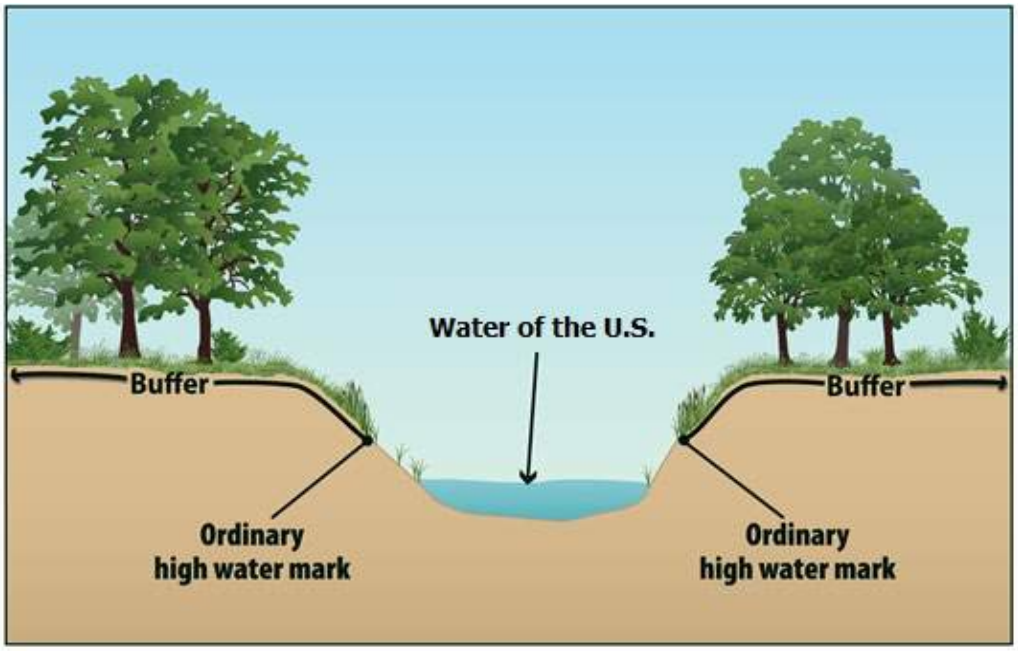


Figure F-2 Buffer measurement from the ordinary high water mark of the water body, as indicated by a clear natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, and/or the presence of litter/debris.

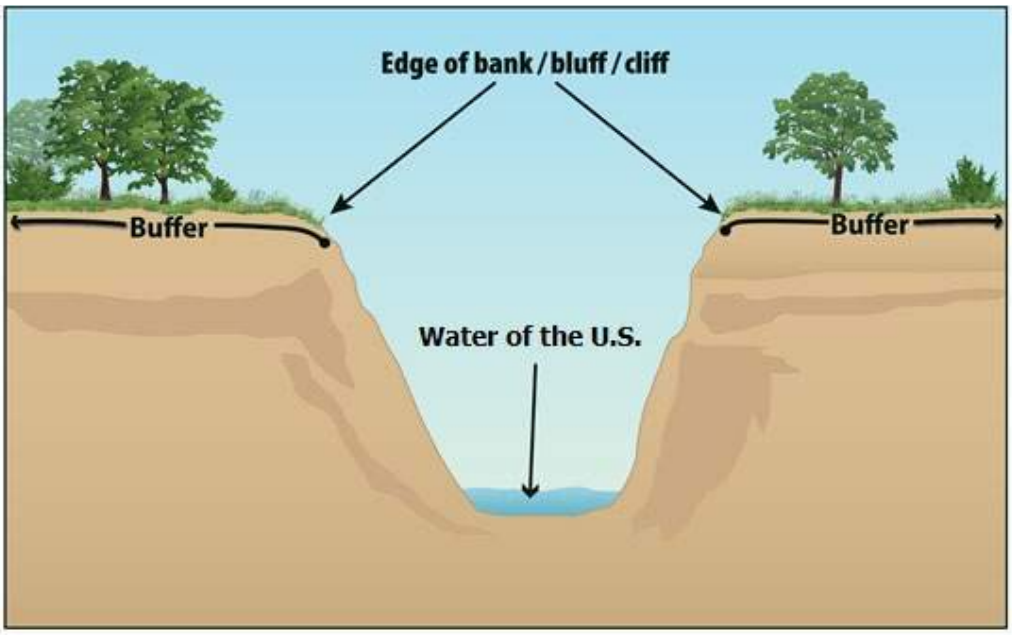


Figure F-3 Buffer measurement from the edge of the bank, bluff, or cliff, whichever is applicable.

Limits to Disturbance Within the Buffer

You are considered to be in compliance with the requirement to provide and maintain a natural buffer if you retain and protect from construction activities the natural buffer that existed prior to the commencement of construction. If the buffer area contains no vegetation prior to the commencement of construction (e.g., sand or rocky surface), you are not required to plant vegetation. As noted above, any preexisting structures or impervious surfaces may occur in the natural buffer provided you retain and protect from disturbance the buffer areas outside of the preexisting disturbance.

To ensure that the water quality protection benefits of the buffer are retained during construction, you are prohibited from conducting any earth-disturbing activities within the buffer during permit coverage. In furtherance of this requirement, **prior to commencing earth-disturbing activities on your site, you must delineate, and clearly mark off, with flags, tape, or a similar marking device, the buffer area on your site.** The purpose of this requirement is to make the buffer area clearly visible to the people working on your site so that unintended disturbances are avoided.

While you are not required to enhance the quality of the vegetation that already exists within the buffer, you are encouraged to do so where such improvements will enhance the water quality protection benefits of the buffer. (Note that any disturbances within the buffer related to buffer enhancement are permitted and do not constitute construction disturbances.) For instance, you may want to target plantings where limited vegetation exists, or replace existing vegetation where invasive or noxious plant species (see http://plants.usda.gov/java/noxiousDriver) have taken over. In the case of invasive or noxious species, you may want to remove and replace them with a diversity of native trees, shrubs, and herbaceous plants that are well-adapted to the climatic, soil, and hydrologic conditions on the site. You are also encouraged to limit the removal of naturally deposited leaf litter, woody debris, and other biomass, as this material contributes to the ability of the buffer to retain water and filter pollutants.

If a portion of the buffer area adjacent to the receiving water is owned by another party and is not under your control, you are only required to retain and protect from construction activities the portion of the buffer area that is under your control. For example, if you comply with compliance alternative 1 (provide and maintain a 50-foot buffer), but 10 feet of land immediately adjacent to the receiving water is owned by a different party than the land on which your construction activities are taking place and you do not have control over that land, you must only retain and protect from construction activities the 40-foot buffer area that occurs adjacent to the property on which your construction activities are taking place. EPA would consider you to be in compliance with this requirement regardless of the activities that are taking place in the 10-foot area that is owned by a different party than the land on which your construction activities are taking place that you have no control over.

Discharges to the Buffer

You must ensure that all discharges from the area of earth disturbance to the natural buffer are first treated by the site's erosion and sediment controls (*for example, you must comply with the Part 2.2.3 requirement to install sediment controls along any perimeter areas of the site that will receive pollutant discharges*), **and if necessary to prevent erosion caused by stormwater flows within the buffer, you must use velocity dissipation devices**. The purpose of this requirement is to decrease the rate of stormwater flow and encourage infiltration so that the pollutant filtering functions of the buffer will be achieved. To comply with this requirement, construction operators typically will use devices that physically dissipate stormwater flows so that the discharge entering the buffer is spread out and slowed down.

SWPPP Documentation

You are required to document in your SWPPP the natural buffer width that is retained. For example, if you are complying with alternative 1, you must specify in your SWPPP that you are providing a 50-foot buffer. Or, if you will be complying with alternative 2, you must document the reduced width of the buffer you will be retaining (and you must also describe the erosion and sediment controls you will use to achieve an equivalent sediment reduction, as required in Part F.2.4 below). Note that you must also show any buffers on your site map in your SWPPP consistent with Part 7.2.4.j. Additionally, if any disturbances related to the exceptions in Part F.2.2 occur within the buffer area, you must document this in the SWPPP.

F.2.4 Guidance for Providing the Equivalent Sediment Reduction as a 50-foot Buffer

This part of the appendix applies to you if you choose compliance alternative 2 (provide and maintain a buffer that is less than 50 feet that is supplemented by erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot buffer) or compliance alternative 3 (implement erosion and sediment controls to achieve the sediment load reduction equivalent to a 50-foot buffer).

Determine Whether it is Feasible to Provide a Reduced Buffer

EPA recognizes that there will be a number of situations in which it will be infeasible to provide and maintain a buffer of any width. While some of these situations may exempt you from the buffer requirement entirely (see F.2.2), if you do not qualify for one of these exemptions, there still may be conditions or circumstances at your site that make it infeasible to provide a natural buffer. For example, there may be sites where a significant portion of the property on which the earth-disturbing activities will occur is located within the buffer area, thereby precluding the retention of natural buffer areas.

Therefore, you should choose compliance alternative 2 if it is feasible for you to retain some natural buffer on your site. (Note: For any buffer width retained, you are required to comply with the requirements in Part F.2.3, above, concerning the retention of vegetation and restricting earth disturbances.) Similarly, if you determine that it is infeasible to provide a natural buffer of any size during construction, you should choose alternative 3.

Design Controls That Provide Equivalent Sediment Reduction as 50-foot Buffer

You must next determine what additional controls must be implemented on your site that, alone or in combination with any retained natural buffer, achieve a reduction in sediment equivalent to that achieved by a 50-foot buffer.

Note that if only a portion of the natural buffer is less than 50 feet, you are only required to implement erosion and sediment controls that achieve the sediment load reduction equivalent to the 50-foot buffer for discharges through that area. You would not be required to provide additional treatment of stormwater discharges that flow through 50 feet or more of natural buffer. See Figure F-4.

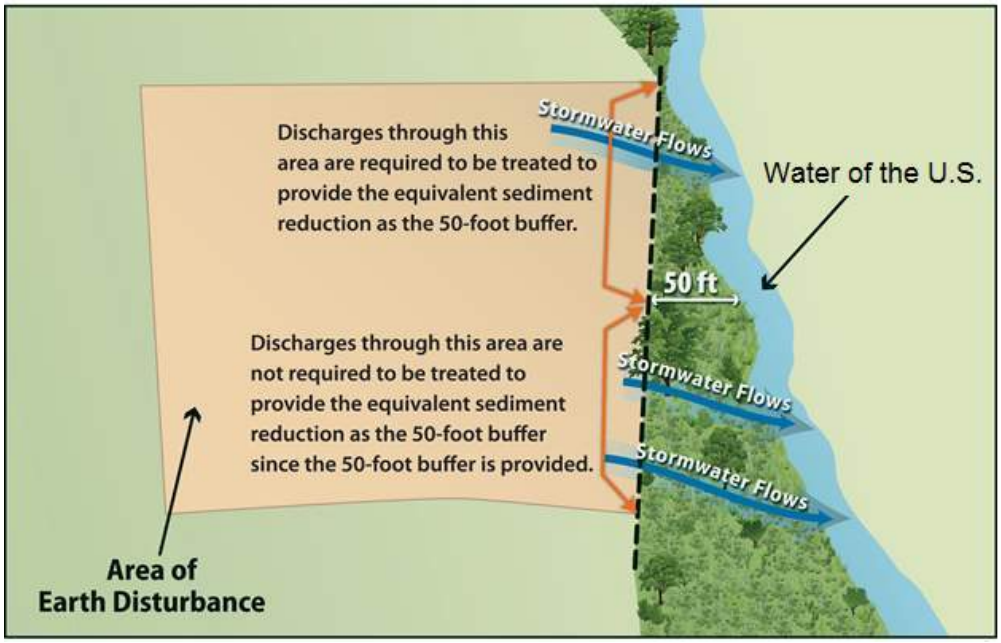

Discharges through this area are required to be treated to provide the equivalent sediment reduction as the 50-foot buffer.
Stormwater Flows
Water of the U.S.
50 ft
Discharges through this area are not required to be treated to provide the equivalent sediment reduction as the 50-foot buffer since the 50-foot buffer is provided.
Stormwater Flows
Stormwater Flows
Area of Earth Disturbance

Figure F-4 Example of how to comply with the requirement to provide the equivalent sediment reduction when only a portion of your earth-disturbances discharge to a buffer of less than 50-feet.

Steps to help you meet compliance alternative 2 and 3 requirements are provided below.

Step 1 - Estimate the Sediment Reduction from the 50-foot Buffer

In order to design controls that match the sediment removal efficiency of a 50-foot buffer, you first need to know what this efficiency is for your site. The sediment removal efficiencies of natural buffers vary according to a number of site-specific factors, including precipitation, soil type, land cover, slope length, width, steepness, and the types of erosion and sediment controls used to reduce the discharge of sediment prior to the buffer. EPA has simplified this calculation by developing buffer performance tables covering a range of vegetation and soil types for the areas covered by the CGP. See

Attachment 1 of this Appendix, Tables F-8 through F-15. Note: buffer performance values in Tables F-8 through F-15 represent the percent of sediment captured through the use of perimeter controls (e.g., silt fences) and 50-foot buffers at disturbed sites of fixed proportions and slopes.[2]

Using Tables F-8 through F-15 (see Attachment 1 of this Appendix), you can determine the sediment removal efficiency of a 50-foot buffer for your geographic area by matching the vegetative cover type that best describes your buffer area and the type of soils that predominate at your site. For example, if your site is located in Massachusetts (Table F-9), and your buffer vegetation corresponds most closely with that of tall fescue grass, and the soil type at your site is best typified as sand, your site's sediment removal efficiency would be 81 percent.

In this step, you should choose the vegetation type in the tables that most closely matches the vegetation that would exist naturally in the buffer area on your site regardless of the condition of the buffer. However, because you are not required to plant any additional vegetation in the buffer area, in determining what controls are necessary to meet this sediment removal equivalency in Step 2 below, you will be able to take credit for this area as a fully vegetated "natural buffer."

Similarly, if a portion of the buffer area adjacent to the receiving water is owned by another party and is not under your control, you can treat the area of land not under your control as having the equivalent vegetative cover and soil type that predominates on the portion of the property on which your construction activities are occurring.

For example, if your earth-disturbances occur within 50 feet of a receiving water, but the 10 feet of land immediately adjacent to the receiving water is owned by a different party than the land on which your construction activities are taking place and you do not have control over that land, you can treat the 10 foot area adjacent to the stream as having the equivalent soil and vegetation type that predominates in

[2] EPA used the following when developing the buffer performance tables:

- The sediment removal efficiencies are based on the U.S. Department of Agriculture's RUSLE2 ("Revised Universal Soil Loss Equation 2") model for slope profiles using a 100-foot long denuded slopes.
- Sediment removal was defined as the annual sediment delivered at the downstream end of the 50-foot natural buffer (tons/yr/acre) divided by the annual yield from denuded area (tons/yr/acre).
- As perimeter controls are also required by the CGP, sediment removal is in part a function of the reduction due to a perimeter control (i.e., silt fence) located between the disturbed portion of the site and the upstream edge of the natural buffer and flow traveling through a 50-foot buffer of undisturbed natural vegetation.
- It was assumed that construction sites have a relatively uniform slope without topographic features that accelerate the concentration for erosive flows.
- It was assumed that vegetation has been removed from the disturbed portion of the site and a combination of cuts and fills have resulted in a smooth soil surface with limited retention of near-surface root mass.

To represent the influence of soil, EPA analyzed 11 general soil texture classifications in its evaluation of buffer performance. To represent different types of buffer vegetation, EPA evaluated 4 or more common vegetative types for each State/Territory covered under the permit. For each vegetation type evaluated, EPA considered only permanent, non-grazed, and non-harvested vegetation, on the assumption that a natural buffer adjacent to the receiving water will typically be undisturbed. EPA also evaluated slope steepness and found that sediment removal efficiencies present in Tables G-8 through G-15 are achievable for slopes that are less than nine percent.

the 40 foot area under your control. You would then make the same assumption in Step 2 for purposes of determining the equivalent sediment removal.

Alternatively, you may do your own calculation of the effectiveness of the 50-foot buffer based upon your site-specific conditions, and may use this number as your sediment removal equivalency standard to meet instead of using Tables F-8 through F-15. This calculation must be documented in your SWPPP.

Step 2 - Design Controls That Match the Sediment Removal Efficiency of the 50-foot Buffer

Once you determine the estimated sediment removal efficiency of a 50-foot buffer for your site in Step 1, you must next select stormwater controls that will provide an equivalent sediment load reduction. These controls can include the installation of a single control, such as a sediment pond or additional perimeter controls, or a combination of stormwater controls. Whichever control(s) you select, you must demonstrate in your SWPPP that the controls will provide at a minimum the same sediment removal capabilities as a 50-foot natural buffer (Step 1). You may take credit for the removal efficiencies of your required perimeter controls in your calculation of equivalency, because these were included in calculating the buffer removal efficiencies in Tables F-8 through F-15. (Note: You are reminded that the controls must be kept in effective operating condition until you complete final stabilization on the disturbed portions of the site discharging to the receiving water)

To make the determination that your controls and/or buffer area achieve an equivalent sediment load reduction as a 50-foot buffer, you should use a model or other type of calculation. As mentioned above, there are a variety of models available that can be used to support your calculation, including USDA's RUSLE-series programs and the WEPP erosion model, SEDCAD, SEDIMOT, or other models. A couple of examples are provided in Attachment 3 to help illustrate how this determination could be made.

If you retain a buffer of less than 50 feet, you may take credit for the removal that will occur from the reduced buffer and only need to provide additional controls to make up the difference between the removal efficiency of a 50 foot buffer and the removal efficiency of the narrower buffer. For example, if you retain a 30 foot buffer, you can account for the sediment removal provided by the 30 foot buffer retained, and you will only need to design controls to make up for the additional removal provided by the 20 feet of buffer that is not being provided. To do this, you would plug the width of the buffer that is retained into RUSLE or another model, along with other stormwater controls that will together achieve a sediment reduction equivalent to a natural 50-foot buffer.

As described in Step 1 above, you can take credit for the area you retained as a "natural buffer" as being fully vegetated, regardless of the condition of the buffer area.

For example, if your earth-disturbances occur 30 feet from a receiving water, but the 10 feet of land immediately adjacent to the receiving water is owned by a different party than the land on which your construction activities are taking place and you do not have control over that land, you can treat the 10-foot area as a natural buffer, regardless of the activities that are taking place in the area. Therefore, you can assume (for purposes of your equivalency calculation) that your site is providing the sediment removal equivalent of a 30-foot buffer, and you will only need to design controls to make up for the additional removal provided by the 20-foot of buffer that is not being provided.

Step 3 - Document How Site-Specific Controls Will Achieve the Sediment Removal Efficiency of the 50-foot Buffer

In Steps 1 and 2, you determined both the expected sediment removal efficiency of a 50-foot buffer at your site, and you used this number as a performance standard to design controls to be installed at your site, which alone or in combination with any retained natural buffer, achieves the expected sediment removal efficiency of a 50-foot buffer at your site. The final step is to document in your SWPPP the information you relied on to calculate the equivalent sediment reduction as an undisturbed natural buffer.

EPA will consider your documentation to be sufficient if it generally meets the following:

- For Step 1, refer to the table in Attachment 1 that you used to derive your estimated 50-foot buffer sediment removal efficiency performance. Include information about the buffer vegetation and soil type that predominate at your site, which you used to select the sediment load reduction value in Tables F-8 through F-15. Or, if you conducted a site-specific calculation for sediment removal efficiency, provide the specific removal efficiency, and the information you relied on to make your site-specific calculation.
- For Step 2, (1) Specify the model you used to estimate sediment load reductions from your site; and (2) the results of calculations showing how your controls will meet or exceed the sediment removal efficiency from Step 1.

If you choose compliance alternative 3, you must also include in your SWPPP a description of why it is infeasible for you to provide and maintain an undisturbed natural buffer of any size.

F.3 SMALL RESIDENTIAL LOT COMPLIANCE ALTERNATIVES

EPA has developed two additional compliance alternatives applicable only to "small residential lots" that are unable to provide and maintain a 50 foot buffer.

A **small residential lot** is a lot or grouping of lots being developed for residential purposes that will disturb less than 1 acre of land, but that is part of a larger residential project that will ultimately disturb greater than or equal to 1 acre.

The following steps describe how a small residential lot operator would achieve compliance with one these 2 alternatives.

F.3.1 Small Residential Lot Compliance Alternative Eligibility

In order to be eligible for the small residential lot compliance alternatives, the following conditions must be met:

a. The lot or grouping of lots meets the definition of "small residential lot"; and

b. The operator must follow the guidance for providing and maintaining a natural buffer in Part F.2.3 of this Appendix, including:

i. Ensure that all discharges from the area of earth disturbance to the natural buffer are first treated by the site's erosion and sediment controls, and use velocity dissipation devices if necessary to prevent erosion caused by stormwater within the buffer;

ii. Document in the SWPPP the natural buffer width retained on the property, and show the buffer boundary on your site plan; and

iii. Delineate, and clearly mark off, with flags, tape, or other similar marking device, all natural buffer areas.

F.3.2 Small Residential Lot Compliance Alternatives

You must next choose from one of two small residential lot compliance alternatives and implement the stormwater control practices associated with that alternative.

Note: The compliance alternatives provided below are not mandatory. Operators of small residential lots can alternatively choose to comply with the any of the options that are available to other sites in Part 2.2.1.a and F.2.1 of this Appendix.

Small Residential Lot Compliance Alternative 1

Alternative 1 is a straightforward tiered-technology approach that specifies the controls that a small residential lot must implement based on the buffer width retained. To meet the requirements of small residential lot compliance alternative 1, you must implement the controls specified in Table F–1 based on the buffer width to be retained. See footnote 3, below, for a description of the controls you must implement.

For example, if you are an operator of a small residential lot that will be retaining a 35-foot buffer and you choose Small Residential Lot Compliance Alternative 1, you must implement double perimeter controls between earth disturbances and the receiving water

In addition to implementing the applicable control, you must also document in your SWPPP how you will comply with small residential lot compliance alternative 1.

Table F-1 Alternative 1 Requirements[3]

Retain 50-foot Buffer	Retain <50 and >30 foot Buffer	Retain ≤ 30 foot Buffer
No Additional Requirements	Double Perimeter Controls	Double Perimeter Controls and 7-Day Site Stabilization

Small Residential Lot Compliance Alternative 2

Alternative 2 specifies the controls that a builder of a small residential lot must implement based on both the buffer width retained and the site's sediment discharge risk. By incorporating the sediment risk, this approach may result in the implementation of controls that are more appropriate for the site's specific conditions.

Step 1 – Determine Your Site's Sediment Risk Level

To meet the requirements of Alternative 2, you must first determine your site's sediment discharge "risk level" based on the site's slope, location, and soil type. To help you to determine your site's sediment risk level, EPA developed five different tables for different slope conditions. You should select the table that most closely corresponds to your site's average slope.

For example, if your site's average slope is 7 percent, you should use Table G–4 to determine your site's sediment risk.

After you determine which table applies to your site, you must then use the table to determine the "risk level" (e.g., "low", "moderate", or "high") that corresponds to your site's location and predominant soil type.[4]

For example, based on Table F-3, a site located in New Hampshire with a 4 percent average slope and with predominately sandy clay loam soils would fall into the "moderate" risk level.

[3] **Description of Additional Controls Applicable to Small Residential Lot Compliance Alternatives 1 and 2:**

- **No Additional Requirements:** If you implement a buffer of 50 feet or greater, then you are not subject to any additional requirements. Note that you are required to install perimeter controls between the disturbed portions of your site and the buffer in accordance with Part 2.2.3.
- **Double Perimeter Control:** In addition to the reduced buffer width retained on your site, you must provide a double row of perimeter controls between the disturbed portion of your site and the receiving water spaced a minimum of 5 feet apart.
- **Double Perimeter Control and 7-Day Site Stabilization:** In addition to the reduced buffer width retained on your site and the perimeter control implemented in accordance with Part 2.2.3, you must provide a double row of perimeter controls between the disturbed portion of your site and the receiving water spaced a minimum of 5 feet apart, and you are required to complete the stabilization activities specified in Parts 2.2.14 within 7 calendar days of the temporary or permanent cessation of earth-disturbing activities.

[4] One source for determining your site's predominant soil type is the USDA's Web Soil Survey located at http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx.

Table F-2 Risk Levels for Sites with Average Slopes of ≤ 3 Percent

Soil Type / Location	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
CNMI / Guam	Moderate	Moderate	Moderate	Moderate	High
Puerto Rico	Moderate	Moderate	Moderate	Moderate	High
Virgin Islands	Low	Moderate	Low	Moderate	Moderate
American Samoa	Moderate	Moderate	Moderate	Moderate	High
Massachusetts and New Hampshire	Low	Moderate	Low	Low	Moderate
Idaho	Low	Low	Low	Low	Low
New Mexico	Low	Low	Low	Low	Low
Washington D.C.	Low	Moderate	Low	Low	Moderate

Table F-3 Risk Levels for Sites with Average Slopes of > 3 Percent and ≤ 6 Percent

Soil Type / Location	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
CNMI / Guam	Moderate	Moderate	Moderate	Moderate	High
Puerto Rico	Moderate	Moderate	Moderate	Moderate	High
Virgin Islands	Moderate	Moderate	Moderate	Moderate	High
American Samoa	High	High	Moderate	High	High
Massachusetts and New Hampshire	Moderate	Moderate	Low	Moderate	High
Idaho	Low	Low	Low	Low	Low
New Mexico	Low	Low	Low	Low	Moderate
Washington D.C.	Moderate	Moderate	Moderate	Moderate	High

Table F-4 Risk Levels for Sites with Average Slopes of > 6 Percent and ≤ 9 Percent

Soil Type / Location	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
CNMI / Guam	Moderate	High	Moderate	High	High
Puerto Rico	Moderate	High	Moderate	Moderate	High
Virgin Islands	Moderate	Moderate	Moderate	Moderate	High
American Samoa	High	High	High	High	High
Massachusetts and New Hampshire	Moderate	Moderate	Moderate	Moderate	High
Idaho	Low	Low	Low	Low	Low
New Mexico	Low	Low	Low	Low	Moderate
Washington D.C.	Moderate	Moderate	Moderate	Moderate	High

Table F-5 Risk Levels for Sites with Average Slopes of > 9 Percent and ≤ 15 Percent

Soil Type / Location	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
CNMI / Guam	High	High	High	High	High
Puerto Rico	High	High	High	High	High
Virgin Islands	Moderate	High	Moderate	High	High
American Samoa	High	High	High	High	High
Massachusetts and New Hampshire	Moderate	Moderate	Moderate	Moderate	High
Idaho	Low	Low	Low	Low	Low
New Mexico	Low	Moderate	Low	Moderate	Moderate
Washington D.C.	Moderate	High	Moderate	Moderate	High

Table F-6 Risk Levels for Sites with Average Slopes of > 15 Percent

Soil Type / Location	Clay	Silty Clay Loam or Clay-Loam	Sand	Sandy Clay Loam, Loamy Sand or Silty Clay	Loam, Silt, Sandy Loam or Silt Loam
CNMI / Guam	High	High	High	High	High
Puerto Rico	High	High	High	High	High
Virgin Islands	High	High	High	High	High
American Samoa	High	High	High	High	High
Massachusetts and New Hampshire	High	High	Moderate	High	High
Idaho	Low	Low	Low	Low	Moderate
New Mexico	Moderate	Moderate	Moderate	Moderate	High
Washington D.C.	High	High	Moderate	High	High

Step 2 – Determine Which Additional Controls Apply

Once you determine your site's "risk level", you must next determine the additional controls you need to implement on your site, based on the width of buffer you plan to retain. Table F-7 specifies the requirements that apply based on the "risk level" and buffer width retained. See footnote 3, above, for a description of the additional controls that are required.

For example, if you are the operator of a small residential lot that falls into the "moderate" risk level, and you decide to retain a 20-foot buffer, using Table F-7 you would determine that you need to implement double perimeter controls to achieve compliance with small residential lot compliance alternative 2.

You must also document in your SWPPP your compliance with small residential lot compliance alternative 2.

Table F-7. Alternative 2 Requirements[2]

Risk Level Based on Estimated Soil Erosion	Retain ≥ 50' Buffer	Retain <50' and >30' Buffer	Retain ≤30' and >10' Buffer	Retain ≤ 10' Buffer
Low Risk	No Additional Requirements	No Additional Requirements	Double Perimeter Control	Double Perimeter Control
Moderate Risk	No Additional Requirements	Double Perimeter Control	Double Perimeter Control	Double Perimeter Control and 7-Day Site Stabilization
High Risk	No Additional Requirements	Double Perimeter Control	Double Perimeter Control and 7-Day Site Stabilization	Double Perimeter Control and 7-Day Site Stabilization

ATTACHMENT 1

Sediment Removal Efficiency Tables[5]

EPA recognizes that very high removal efficiencies, even where theoretically achievable by a 50-foot buffer, may be very difficult to achieve in practice using alternative controls. Therefore in the tables below, EPA has limited the removal efficiencies to a maximum of 90%. Efficiencies that were calculated at greater than 90% are shown as 90%, and this is the minimum percent removal that must be achieved by alternative controls.

Table F-8 Estimated 50-foot Buffer Performance in Idaho*

	Estimated % Sediment Removal				
Type of Buffer Vegetation**	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Tall Fescue Grass	42	52	44	48	85
Medium-density Weeds	28	30	28	26	60
Low-density Warm-season Native Bunchgrass (i.e., Grama Grass)	25	26	24	24	55
Northern Mixed Prairie Grass	28	30	28	26	50
Northern Range Cold Desert Shrubs	28	28	24	26	50

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

Table F-9 Estimated 50-foot Buffer Performance in Massachusetts and New Hampshire*

	Estimated % Sediment Removal				
Type of Buffer Vegetation**	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Warm-season Grass (i.e., Switchgrass, Lemongrass)	79	90	90	90	90
Cool-season Dense Grass (Kentucky Bluegrass, Smooth Bromegrass, Timothy)	78	90	90	90	90
Tall Fescue Grass	76	90	81	89	90
Medium-density Weeds	66	76	60	72	66

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

[5] The buffer performances were calculated based on a denuded slope upgradient of a 50-foot buffer and a perimeter controls, as perimeter controls are a standard requirement (see Part 2.2.3).

Table F-10 Estimated 50-foot Buffer Performance in New Mexico*

	Estimated % Sediment Removal				
Type of Buffer Vegetation **	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Tall Fescue grass	71	85	80	86	90
Medium-density Weeds	56	73	55	66	78
Low-density Warm-season Native Bunchgrass (i.e., Grama Grass)	53	70	51	62	67
Southern Mixed Prairie Grass	53	71	52	63	50
Southern Range Cold Desert Shrubs	56	73	55	65	53

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

Table F-11 Estimated 50-foot Buffer Performance in Washington, DC*

	Estimated % Sediment Removal				
Type of Buffer Vegetation **	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Warm-season Grass (i.e., Switchgrass, Lemongrass)	82	90	90	90	90
Cool-season Dense Grass (Kentucky Bluegrass, Smooth Bromegrass, Timothy)	81	90	90	90	90
Tall Fescue Grass	79	90	83	89	90
Medium-density Weeds	71	79	66	75	74

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

Table F-12 Estimated 50-foot Buffer Performance in American Samoa*

	Estimated % Sediment Removal				
Type of Buffer Vegetation **	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Bahiagrass (Permanent cover)	82	90	90	90	83
Warm-season Grass (i.e., Switchgrass, Lemongrass)	82	90	90	90	85
Dense Grass	82	90	90	90	83
Tall Fescue Grass	82	89	82	89	79
Medium-density Weeds	70	73	62	75	59

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

Table F-13 Estimated 50-foot Buffer Performance in CNMI and Guam*

	Estimated % Sediment Removal				
Type of Buffer Vegetation **	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Bahiagrass (Permanent cover)	80	90	90	90	89
Warm-season Grass (i.e., Switchgrass, Lemongrass)	80	90	90	90	90
Dense Grass	79	90	90	90	89
Tall Fescue Grass	76	90	80	88	87
Medium-density Weeds	63	73	53	68	61

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

Table F-14 Estimated 50-foot Buffer Performance in Puerto Rico*

	Estimated % Sediment Removal				
Type of Buffer Vegetation**	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Bahiagrass (Permanent cover)	83	90	90	90	90
Warm-season Grass (i.e., Switchgrass, Lemongrass)	83	90	90	90	90
Dense Grass	83	90	90	90	90
Tall Fescue Grass	82	90	84	90	89
Medium-density Weeds	72	78	65	76	64

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

Table F-15 Estimated 50-foot Buffer Performance in Virgin Islands*

Type of Buffer Vegetation**	**Clay**	**Silty Clay Loam or Clay-Loam**	**Sand**	**Sandy Clay Loam, Loamy Sand or Silty Clay**	**Loam, Silt, Sandy Loam or Silt Loam**
Bahiagrass (Permanent cover)	85	90	90	90	90
Warm-season Grass (i.e., Switchgrass, Lemongrass)	86	90	90	90	90
Dense Grass	85	90	90	90	90
Tall Fescue Grass	85	90	88	90	89
Medium-density Weeds	75	77	71	78	63

* Applicable for sites with less than nine percent slope
** Characterization focuses on the under-story vegetation

ATTACHMENT 2

Using the Sediment Removal Efficiency Tables – Questions and Answers

- *What if my specific buffer vegetation is not represented in Tables F-8 through F-15?* Tables F-8 through F-15 provide a wide range of factors affecting buffer performance; however, there are likely instances where the specific buffer vegetation type on your site is not listed. If you do not see a description of the type of vegetation present at your site, you should choose the vegetation type that most closely matches the vegetation type on your site. You can contact your local Cooperative Extension Service Office (http://nifa.usda.gov/partners-and-extension-map) for assistance in determining the vegetation type in Tables F-8 through F-15 that most closely matches your site-specific vegetation.
- *What if there is high variability in local soils?* EPA recognizes that there may be a number of different soil type(s) on any given construction site. General soil information can be obtained from USDA soil survey reports (http://websoilsurvey.nrcs.usda.gov) or from individual site assessments performed by a certified soil expert. Tables F-8 through F-15 present eleven generic soil texture classes, grouping individual textures where EPA has determined that performance is similar. If your site contains different soil texture classes, you should use the soil type that best approximates the predominant soil type at your site.
- *What if my site slope is greater than 9 percent after final grade is reached?* As indicated in the buffer performance tables, the estimated sediment removal efficiencies are associated with disturbed slopes of up to 9 percent grade. Where your graded site has an average slope of greater than 9 percent, you should calculate a site-specific buffer performance.
- *How do I calculate my own estimates for sediment reduction at my specific site?* If you determine that it is necessary to calculate your own sediment removal efficiency using site-specific conditions (e.g., slopes at your site are greater than 9 percent), you can use a range of available models that are available to facilitate this calculation, including USDA's RUSLE-series programs and the WEPP erosion model, SEDCAD, SEDIMOT, or other equivalent models.
- *What is my estimated buffer performance if my site location is not represented by Tables F-8 through F-15?* If your site is located in an area not represented by Tables F-8 through F-15, you should use the table that most closely approximates conditions at your site. You may instead choose to conduct a site-specific calculation of the buffer performance.
- *What if only a portion of my site drains to the buffer area?* If only a portion of your site drains to a receiving water, where that water is within 50 feet of your earth disturbances, you are only required to meet the equivalency requirement for the stormwater flows corresponding to those portions of the site. See Example 2 below for an example of how this is expected to work.

ATTACHMENT 3

Examples of How to Use the Sediment Removal Efficiency Tables

Example 1. Comparatively Wet Location (7.5 acre site located in Massachusetts)

The operator of a 7.5-acre construction site in Massachusetts has determined that it is infeasible to establish a buffer of any size on the site, and is now required to select and install controls that will achieve an equivalent sediment load reduction as that estimated in F-9 for their site conditions. The first step is to identify what percentage of eroded sediment is estimated to be retained from a 50-foot buffer. For this example, it is assumed that the site has a relatively uniform gentle slope (3 percent), so Table F-9 can be used to estimate the 50-foot buffer sediment load reduction. If the site's buffer vegetation is best typified by cool-season dense grass and the underlying soil is of a type best described as loamy sand, the 50-foot buffer is projected to capture 90 percent of eroded sediment from the construction site.

The second step is to determine what sediment controls can be selected and installed in combination with the perimeter controls already required to be implemented at the site (see Part 2.2.3), which will achieve the 90 percent sediment removal efficiency from Table F-9. For this example, using the RUSLE2 profile model, it was determined that installing a pair of shallow-sloped diversion ditches to convey runoff to a well-designed and maintained sediment basin provides 99 percent sediment removal. Because the estimated sediment reduction is greater than the required 90 percent that a 50-foot buffer provides, the operator will have met the buffer requirements. See Figure F-5. The operator could also choose a different set of controls, as long as they achieve at least a 90 percent sediment removal efficiency.

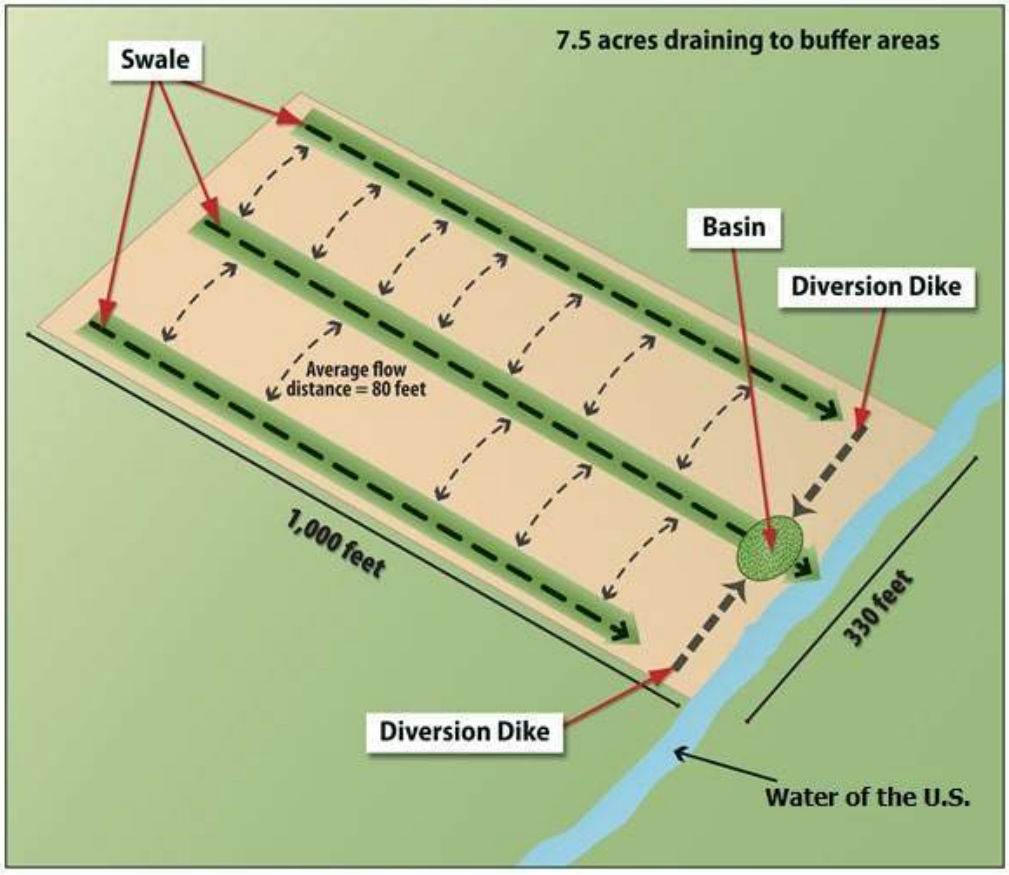


Figure F-5 Example 1 – Equivalent Sediment Load Reductions at a 7.5 ac Site in MA.

Example 2. Arid Location With Pre-existing Disturbances in the Natural Buffer (6.5 acre site located in New Mexico)

An operator of a site in New Mexico determines that it is not feasible to provide a 50-foot buffer, but a 28-foot buffer can be provided. Because the operator will provide a buffer that is less than 50 feet, the operator must determine which controls, in combination with the 28-foot buffer, achieve a sediment load reduction equivalent to the 50-foot buffer. In this example, the project will disturb 6.5 acres of land, but only 1.5 acres of the total disturbed area drains to the buffer area. Within the 28-foot buffer area is a preexisting concrete walkway. Similar to Example 1, the equivalence analysis starts with Step 1 in Part F.2.4 of this Appendix with a review of the New Mexico buffer performance (Table F-10). The operator determines that the predominate vegetation type in the buffer area is prairie grass, the soil type is similar to silt, and the site is of a uniform, shallow slope (e.g., 3 percent grade). Although the operator will take credit for the disturbance caused by the concrete walkway as a natural buffer in Step 2, here the operator can treat the entire buffer area as being naturally vegetated with prairie grass. Based on this information, the operator refers to Table F-10 to estimate that the 50-foot buffer would retain 50 percent of eroded soil.

The second step is to determine, based on the 50 percent sediment removal efficiency found in Table F-10, what sediment controls, in combination with the 28-foot buffer area, can be implemented to reduce sediment loads by 50 percent or more. The operator does not have to account the reduction in buffer function caused by the preexisting walkway, and can take credit for the entire 28-foot buffer being fully vegetated in the analysis. For this example, using the RUSLE2 profile model, the operator determined that installing a fiber roll barrier between the

silt fence (already required by Part 2.2.3) and the 28-foot buffer will achieve an estimated 84 percent sediment removal efficiency. See Figure F-6. Note that this operator is subject to the requirement in Part F.2.3 of this Appendix to ensure that discharges through the silt fence, fiber roll barrier, and 28-foot buffer do not cause erosion within the buffer. The estimated sediment reduction is greater than the required 50 percent; therefore the operator will have met the buffer alternative requirement.

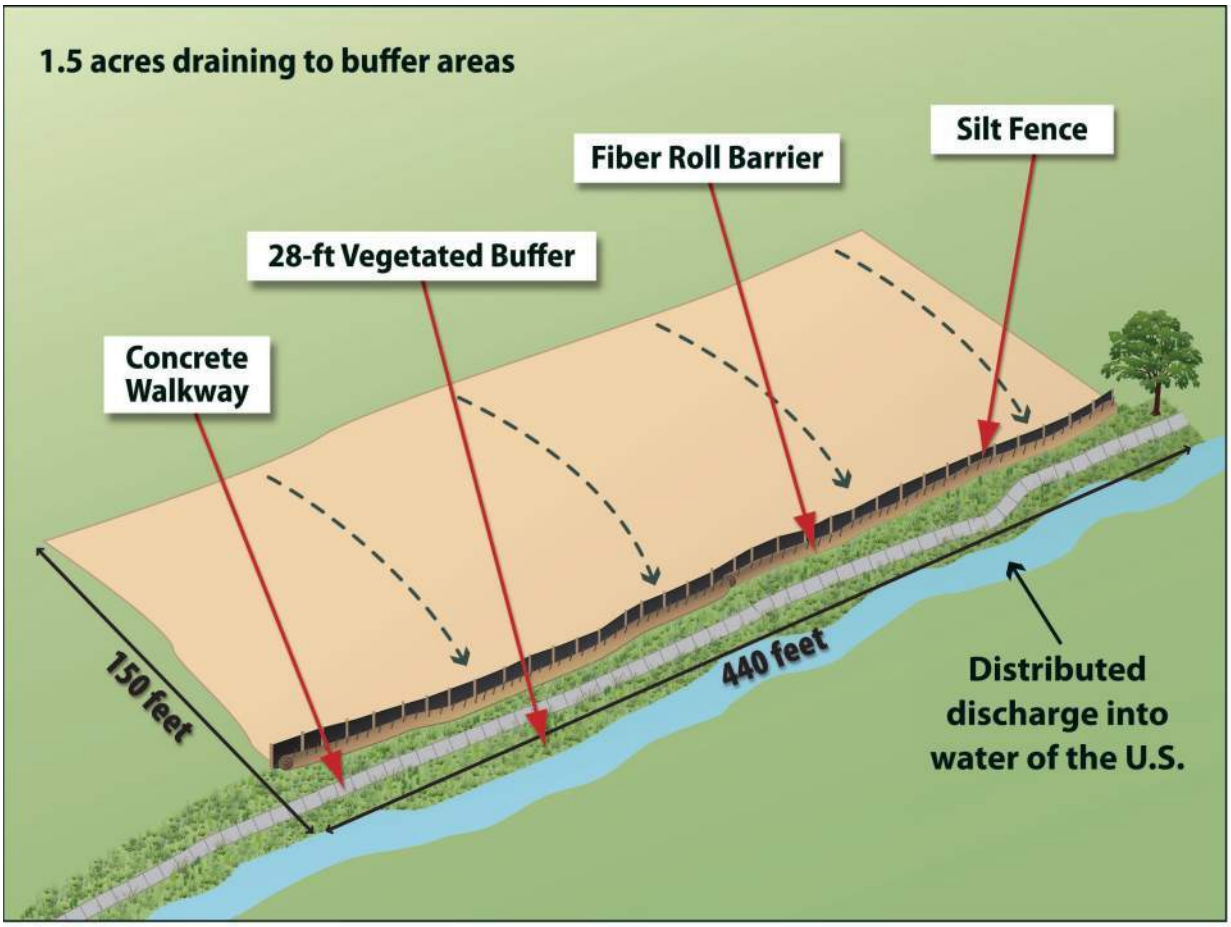


Figure F-6 Example 2 – Equivalent Sediment Load Reductions at a 6.5 ac Site in NM.

Appendix G - Standard Permit Conditions

Standard permit conditions in Appendix G are consistent with the general permit provisions required under 40 CFR 122.41.

G.1 Duty To Comply.

You must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

G.1.1 You must comply with effluent standards or prohibitions established under section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards, even if the permit has not yet been modified to incorporate the requirement.

G.1.2 Penalties for Violations of Permit Conditions: EPA and other federal agencies are required to adjust their maximum and minimum statutory civil penalty amounts through rulemaking by January 15 each year to account for inflation. EPA's annual rulemaking adjustments, codified in 40 C.F.R. § 19.4, are mandated by the Federal Civil Penalties Inflation Adjustment Act of 1990, as amended through the Federal Civil Penalties Inflation Adjustment Act Improvements Act of 2015 (28 U.S.C. § 2461 note). As such, the civil penalty amounts below may change in the future due to inflation. See 40 C.F.R. § 19.4 for the most up-to-date civil penalty amounts.

G.1.2.1 *Criminal Penalties.*

a. *Negligent Violations*. The CWA provides that any person who negligently violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to criminal penalties of not less than $2,500 nor more than $25,000 per day of violation, or imprisonment of not more than one year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than $50,000 per day of violation or by imprisonment of not more than two years, or both.

b. *Knowing Violations.* The CWA provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than $5,000 nor morethan $50,000 per day of violation, or by imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both.

c. *Knowing Endangerment.* The CWA provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act and who knows at that time that he or she is placing another person in imminent danger of death or serious bodily injury shall upon conviction be subject to a fine of not more than $250,000 or by imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, aperson shall be subject to a fine of not more than $500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in section 309(c)(3)(B)(iii) of the Act, shall, upon conviction of violating the imminent danger provision be subject to a fine of not more than $1,000,000 and can fined up to $2,000,000 for second or subsequent convictions.

d. *False Statement.* The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both. The Act further provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

G.1.2.2 *Civil Penalties.* The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a civil penalty not to exceed the maximum amount authorized by Section 309(d) of the Act, as adjusted pursuant to the Federal Civil Penalties Inflation Adjustment Act of 1990 (28 U.S.C. § 2461 note), and codified at 40 CFR § 19.4.

G.1.2.3 *Administrative Penalties.* The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to an administrative penalty, as follows:

a. *Class I Penalty*. Not to exceed the maximum amounts authorized by Section 309(g)(2)(A) of the Act and the Federal Civil Penalties Inflation Adjustment Act of 1990 as amended by the Federal Civil Penalties Inflation Adjustment Act Improvements Act of 2015 (28 U.S.C. § 2461 note), and codified at 40 CFR § 19.4.

b. *Class II Penalty*. Not to exceed the maximum amounts authorized by Section 309(g)(2)(B) of the Act and the Federal Civil Penalties Inflation Adjustment Act of 1990, as amended by the Federal Civil Penalties Inflation Adjustment Act Improvements Act of 2015 (28 U.S.C. § 2461 note), and codified at 40 CFR § 19.4.

G.2 Duty to Reapply.

If you wish to continue an activity regulated by this permit after the expiration date of this permit, you must apply for and obtain authorization as required by the new permit once EPA issues it.

G.3 Need to Halt or Reduce Activity Not a Defense.

It shall not be a defense for you in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

G.4 Duty to Mitigate.

You must take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

G.5 Proper Operation and Maintenance.

You must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by you to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the

operation of backup or auxiliary facilities or similar systems which are installed by you only when the operation is necessary to achieve compliance with the conditions of this permit.

G.6 Permit Actions.

This permit may be modified, revoked and reissued, or terminated for cause. Your filing of a request for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

G.7 Property Rights.

This permit does not convey any property rights of any sort, or any exclusive privileges.

G.8 Duty to Provide Information.

You must furnish to EPA or an authorized representative (including an authorized contractor acting as a representative of EPA), within a reasonable time, any information that EPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. You must also furnish to EPA or an authorized representative upon request, copies of records required to be kept by this permit.

G.9 Inspection and Entry.

You must allow EPA or an authorized representative (including an authorized contractor acting as a representative of EPA), upon presentation of credentials and other documents as may be required by law, to:

G.9.1 Enter upon your premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

G.9.2 Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

G.9.3 Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

G.9.4 Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

G.10 Monitoring and Records.

G.10.1 Samples and measurements taken for the purpose of monitoring must be representative of the volume and nature of the monitored activity.

G.10.2 You must retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three years from the date the permit expires or the date the permittee's authorization is terminated. This period may be extended by request of EPA at any time.

G.10.3 Records of monitoring information must include:

G.10.3.1 The date, exact place, and time of sampling or measurements;

G.10.3.2 The individual(s) who performed the sampling or measurements;

G.10.3.3 The date(s) analyses were performed

G.10.3.4 The individual(s) who performed the analyses;

G.10.3.5 The analytical techniques or methods used; and

G.10.3.6 The results of such analyses.

G.10.4 Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in the permit.

G.10.5 The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than 4 years, or both.

G.11 Signatory Requirements.

G.11.1 All applications, including NOIs and NOTs, must be signed as follows:

G.11.1.1 For a corporation: By a responsible corporate officer. For the purpose of this subsection, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

G.11.1.2 For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

G.11.1.3 For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this subsection, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

G.11.2 Your SWPPP (including changes to your SWPPP inspection reports), corrective action log, turbidity monitoring report, site inspection and dewatering inspection reports, and any other compliance documentation required under this permit, must be signed by a person described in Appendix G, Subsection G.11.1 above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

G.11.2.1 The authorization is made in writing by a person described in Appendix G, Subsection G.11.1;

G.11.2.2 The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental

matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and

G.11.2.3 The signed and dated written authorization is included in the SWPPP. A copy must be submitted to EPA, if requested.

G.11.3 Changes to Authorization. If an authorization under this permit is no longer accurate because a different operator has responsibility for the overall operation of the construction site, a new NOI must be submitted to EPA. See Table 1 in Part 1.4.3 of the permit. However, if the only change that is occurring is a change in contact information or a change in the facility's address, the operator need only make a modification to the existing NOI submitted for authorization.

G.11.4 Any person signing documents in accordance with Appendix G, Subsections G.11.1 or G.11.2 above must include the following certification:

> "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

G.11.5 For persons signing NOIs electronically, in addition to meeting other applicable requirements in Appendix G, Subsection G.11, such signatures must meet the same signature, authentication, and identity-proofing standards set forth at 40 CFR § 3.2000(b) for electronic reports (including robust second-factor authentication).

G.11.6 The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

G.12 Reporting Requirements.

G.12.1 Planned changes. You must give notice to EPA as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

G.12.1.1 The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b); or

G.12.1.2 The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under 40 CFR 122.42(a)(1).

G.12.2 Anticipated noncompliance. You must give advance notice to EPA of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

G.12.3 Transfers. This permit is not transferable to any person except after notice to EPA. Where a facility wants to change the name of the permittee, the original permittee (the first owner or operators) must submit a Notice of Termination pursuant to Part 8. The new

owner or operator must submit a Notice of Intent in accordance with Part 1.4 and Table 1. See also requirements in Appendix G, Subsections G.11.1 and G.11.2.

G.12.4 Monitoring reports. Monitoring results must be reported at the intervals specified elsewhere in this permit.

G.12.4.1 Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms provided or specified by EPA for reporting results of monitoring of sludge use or disposal practices.

G.12.4.2 If you monitor any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR 136 unless otherwise specified in 40 CFR Part 503, or as specified in the permit, the results of this monitoring must be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by EPA.

G.12.5 Compliance schedules. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date.

G.12.6 Twenty-four hour reporting. In addition to reports required elsewhere in this permit:

G.12.6.1 You must report any noncompliance which may endanger health or the environment directly to the EPA Regional Office (see contacts at https://www2.epa.gov/national-pollutant-discharge-elimination-system-npdes/contact-us-stormwater#regional). Any information must be provided orally within 24 hours from the time you become aware of the circumstances. A written submission must also be provided within five days of the time you become aware of the circumstances. The written submission must contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

G.12.6.2 The following shall be included as information which must be reported within 24 hours under this paragraph.

a. Any unanticipated bypass which exceeds any effluent limitation in the permit. (See 40 CFR 122.41(m)(3)(ii))

b. Any upset which exceeds any effluent limitation in the permit

c. Violation of a maximum daily discharge limit for any numeric effluent limitation. (See 40 CFR 122.44(g).)

G.12.6.3 EPA may waive the written report on a case-by-case basis for reports under Appendix G, Subsection G.12.6.2 if the oral report has been received within 24 hours.

G.12.7 Other noncompliance. You must report all instances of noncompliance not reported under Appendix G, Subsections G.12.4, G.12.5, and G.12.6, at the time monitoring reports are submitted. The reports must contain the information listed in Appendix G, Subsection G.12.6.

G.12.8 Other information. Where you become aware that you failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Permitting Authority, you must promptly submit such facts or information.

G.13 Bypass.

G.13.1 Definitions.

G.13.1.1 Bypass means the intentional diversion of waste streams from any portion of a treatment facility See 40 CFR 122.41(m)(1)(i).

G.13.1.2 Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. See 40 CFR 122.41(m)(1)(ii).

G.13.2 Bypass not exceeding limitations. You may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Appendix G, Subsections G.13.3 and G.13.4. See 40 CFR 122.41(m)(2).

G.13.3 Notice.

G.13.3.1 Anticipated bypass. If you know in advance of the need for a bypass, you must submit prior notice, if possible at least ten days before the date of the bypass. See 40 CFR 122.41(m)(3)(i).

G.13.3.2 Unanticipated bypass. You must submit notice of an unanticipated bypass as required in Appendix G, Subsection G.12.6 (24-hour notice). See 40 CFR 122.41(m)(3)(ii).

G.13.4 Prohibition of bypass. See 40 CFR 122.41(m)(4).

G.13.4.1 Bypass is prohibited, and EPA may take enforcement action against you for bypass, unless:

a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

c. You submitted notices as required under Appendix G, Subsection G.13.3.

G.13.4.2 EPA may approve an anticipated bypass, after considering its adverse effects, if EPA determines that it will meet the three conditions listed above in Appendix G, Subsection G.13.4.1.

G.14 Upset.

G.14.1 Definition. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond your reasonable control. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. See 40 CFR 122.41(n)(1).

G.14.2 Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Appendix G, Subsection G.14.3 are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. See 40 CFR 122.41(n)(2).

G.14.3 Conditions necessary for a demonstration of upset. See 40 CFR 122.41(n)(3). A permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

G.14.3.1 An upset occurred and that you can identify the cause(s) of the upset;

G.14.3.2 The permitted facility was at the time being properly operated; and

G.14.3.3 You submitted notice of the upset as required in Appendix G, Subsection G.12.6.2.b (24 hour notice).

G.14.3.4 You complied with any remedial measures required under Appendix G, Subsection G.4.

G.14.4 Burden of proof. In any enforcement proceeding, you, as the one seeking to establish the occurrence of an upset, have the burden of proof. See 40 CFR 122.41(n)(4).

G.15 Retention of Records.

Copies of the SWPPP and all documentation required by this permit, including records of all data used to complete the NOI to be covered by this permit, must be retained for at least three years from the date that permit coverage expires or is terminated. This period may be extended by request of EPA at any time.

G.16 Reopener Clause.

G.16.1 Procedures for modification or revocation. Permit modification or revocation will be conducted according to 40 CFR §122.62, §122.63, §122.64 and §124.5.

G.16.2 Water quality protection. If there is evidence indicating that the stormwater discharges authorized by this permit cause, have the reasonable potential to cause or contribute to an excursion above any applicable water quality standard, you may be required to obtain an individual permit, or the permit may be modified to include different limitations and/or requirements.

G.16.3 Timing of permit modification. EPA may elect to modify the permit prior to its expiration (rather than waiting for the new permit cycle) to comply with any new statutory or regulatory requirements, such as for effluent limitation guidelines that may be promulgated in the course of the current permit cycle.

G.17 Severability.

Invalidation of a portion of this permit does not necessarily render the whole permit invalid. EPA's intent is that the permit is to remain in effect to the extent possible; in the event that any part of this permit is invalidated, EPA will advise the regulated community as to the effect of such invalidation.

Appendix H - Notice of Intent (NOI) Form and Instructions

Part 1.4.1 requires you to use the NPDES eReporting Tool, or "NeT" system, to prepare and submit your NOI electronically. However, if the EPA Regional Office grants you a waiver to use a paper NOI form, and you elect to use it, you must complete and submit the following form.

NPDES Form 3510-9	EPA	U.S. Environmental Protection Agency Washington, DC 20460 Notice of Intent for the 2022 NPDES Construction General Permit	OMB No. 2040-0305 Exp. Date 01/31/2025

Submission of this Notice of Intent (NOI) constitutes notice that the operator identified in Section III of this form requests authorization to discharge pursuant to the NPDES Construction General Permit (CGP) permit number identified in Section II of this form. Submission of this NOI also constitutes notice that the operator identified in Section III of this form meets the eligibility requirements of Part 1.1 CGP for the project identified in Section IV of this form. Permit coverage is required prior to commencement of construction activity until you are eligible to terminate coverage as detailed in Part 8 of the CGP. To obtain authorization, you must submit a complete and accurate NOI form. Discharges are not authorized if your NOI is incomplete or inaccurate or if you were never eligible for permit coverage. Refer to the instructions at the end of this form.

SECTION I. APPROVAL TO USE PAPER NOI FORM

Paper NOI Form

Have you been granted a waiver from electronic reporting from the Regional Office*? ☐ Yes ☐ No

If yes, check which waiver you have been granted, the name of the EPA Regional Office staff person who granted the waiver, and the date of approval:

Waiver granted:

☐ The owner/operator's headquarters is physically located in a geographic area (i.e., ZIP code or census tract) that is identified as under-served for broadband Internet access in the most recent report from the Federal Communications Commission.

☐ The owner/operator has issues regarding available computer access or computer capability.

Name of EPA staff person that granted the waiver	Date approval obtained (MM/DD/YYYY)

*** Note: You are required to obtain approval from the applicable Regional Office prior to using this paper NOI form. If you have not obtained a waiver, you must file this form electronically using the NPDES eReporting Tool (NeT).**

SECTION II. PERMIT INFORMATION

Permit

NPDES ID (EPA Use Only)	Master Permit Number (see Appendix B of the CGP for the list of eligible permit numbers)

SECTION III. OPERATOR INFORMATION

Operator Information

Operator Name

Are you requesting coverage under this NOI as a "Federal Operator" or for a "Federal Facility" as defined in Appendix A? ☐ Yes ☐ No

Mailing Address

Street

City	State	ZIP Code

County or Similar Government Division

Operator Point of Contact Information:

First Name	Middle Initial	Last Name

Title

Phone Number	Email Address

NOI Preparer

Complete if NOI was prepared by someone other than the certifier:

First Name	Middle Initial	Last Name

Organization

Phone number	Email address

SECTION IV. PROJECT/SITE INFORMATION

Project/Site Address

Project/Site Name

Street/Location

City	State	ZIP Code

County or Similar Government Division:

For the project/site you are seeking permit coverage, provide the following information:

Latitude (in decimal degrees to four decimal places):	Longitude (in decimal degrees to four decimal places):
° N	° W

Latitude/Longitude Data Source: ☐ Map ☐ GPS ☐ Other (Specify):

Horizontal Reference Datum: ☐ NAD 27 ☐ NAD 83 ☐ WGS 84

Site Information

Is your site located in Indian country lands, or on a property of religious or cultural significance to an Indian Tribe? ☐ Yes ☐ No

If yes, provide the name of the Indian Tribe associated with the area of Indian country (including name of Indian reservation, if applicable), or if not in Indian country, provide the name of the Indian Tribe associated with the property:

Project Information

Estimated Project Start Date (MM/DD/YYYY)	Estimated Project Completion Date (MM/DD/YYYY)

Estimated Area to be Disturbed (to the nearest quarter acre):

Type of Construction Site (check all that apply):

☐ Single-Family Residential ☐ Multi-Family Residential ☐ Commercial

☐ Industrial ☐ Institutional ☐ Highway or Road

☐ Utility ☐ Other (Specify):

Was the pre-development land use used for agriculture (see Appendix A for definition of "agricultural land")? ☐ Yes ☐ No

Have earth-disturbing activities commenced on your project/site? ☐ Yes ☒ No

If yes, is your project an "emergency-related project" (see Appendix A)? ☒ Yes ☐ No

Project Information

Have stormwater discharges from your project/site been covered previously under an NPDES permit?	☐ Yes	☐ No
If yes, provide the NPDES ID (if you had coverage under EPA's 2017 CGP) or the NPDES permit number (if you had coverage under an EPA individual permit): _____		
Are there other operators that are covered under this permit for the same project site?	☐ Yes	☐ No
If yes, provide the NPDES ID number for all other operators at the site who have coverage under this permit: _____		
Will there be demolition of any structure built or renovated before January 1, 1980?	☐ Yes	☐ No
If yes, do any of the structures being demolished have at least 10,000 square feet of floor space?	☐ Yes	☐ No
Will you be discharging dewatering water from your site?	☐ Yes	☐ No
If yes, will you be discharging dewatering water from a current or former Federal or State remediation site?	☐ Yes	☐ No

SECTION V. DISCHARGE INFORMATION

Project Information

By indicating "Yes," I confirm that I understand that the CGP only authorizes the allowable stormwater discharges in Part 1.2.1 and the allowable non-stormwater discharges listed in Part 1.2.2. Any discharges not expressly authorized in this permit cannot become authorized or shielded from liability under CWA section 402(k) by disclosure to EPA, State, or local authorities after issuance of this permit via any means, including the Notice of Intent (NOI) to be covered by the permit, the Stormwater Pollution Prevention Plan (SWPPP), during an inspection, etc. If any discharges requiring NPDES permit coverage other than the allowable stormwater and non-stormwater discharges listed in Parts 1.2.1 and 1.2.2 will be discharged, they must be covered under another NPDES permit.	☐ Yes	
Does your project/site discharge stormwater into a Municipal Separate Storm Sewer System (MS4)?	☐ Yes	☐ No
Are there any waters of the U.S. within 50 feet of your project's earth disturbances?	☐ Yes	☐ No

Receiving Waters Information

For each point of discharge, provide the following receiving water information. (Attach a separate list if necessary)

Point of Discharge ID	Provide the name of the first water of the U.S. that receives stormwater directly from the point of discharge and/or from the MS4 that the point of discharge discharges to:	If the receiving water is impaired (on the CWA 303(d) list), list the pollutants that are causing the impairment:	If a TMDL been completed for this receiving waterbody, providing the following information:
			TMDL Name and ID:
			Pollutant(s) for which there is a TMDL:
			TMDL Name and ID:
			Pollutant(s) for which there is a TMDL:

Receiving Waters Information

For each point of discharge, provide the following receiving water information. (Attach a separate list if necessary)			
Point of Discharge ID	**Provide the name of the first water of the U.S. that receives stormwater directly from the point of discharge and/or from the MS4 that the point of discharge discharges to:**	**If the receiving water is impaired (on the CWA 303(d) list), list the pollutants that are causing the impairment:**	**If a TMDL been completed for this receiving waterbody, providing the following information:**
			TMDL Name and ID: **Pollutant(s) for which there is a TMDL:**
			TMDL Name and ID: **Pollutant(s) for which there is a TMDL:**
			TMDL Name and ID: **Pollutant(s) for which there is a TMDL:**
			TMDL Name and ID: **Pollutant(s) for which there is a TMDL:**
			TMDL Name and ID: **Pollutant(s) for which there is a TMDL:**

Are any of the waters of the U.S. to which you discharge designated by the State or Tribal authority under its antidegradation policy as a Tier 2 (or Tier 2.5) water (water quality exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water) or as a Tier 3 water (Outstanding National Resource Water)? (See Appendix F). ☐ Yes ☐ No

If yes, name(s) of receiving water(s) and its designation (Tier 2, Tier 2.5 or Tier 3):

SECTION VI. CHEMICAL TREATMENT INFORMATION

Chemical Treatment

Will you use polymers, flocculants, or other treatment chemicals at your construction site? ☐ Yes ☐ No

If yes, will you use cationic treatment chemicals at your construction site*? ☐ Yes ☐ No

If yes, have you been authorized to use cationic treatment chemicals by your applicable EPA Regional Office in advance of filing your NOI*? ☐ Yes ☐ No

If you have been authorized to use cationic treatment chemicals by your applicable EPA Regional Office, attach a copy of your authorization letter and include documentation of the appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards.

Please indicate the treatment chemicals that you will use:

* Note: You are ineligible for coverage under this permit unless you notify your applicable EPA Regional Office in advance and the EPA office authorizes coverage under this permit after you have included appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards.

SECTION VII. STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AND PERSONNEL TRAINING INFORMATION

SWPPP

Has the SWPPP been prepared in advance of filing this NOI, as required? ☐ Yes ☐ No

By indicating "Yes," I confirm that all required personnel, including those conducting inspections at your site, will meet the training requirements in Part 6 of this permit. ☐ Yes

SWPPP Contact Information

First Name	Middle Initial	Last Name

Professional Title

Phone number	Email address

SECTION VIII. ENDANGERED SPECIES PROTECTION

Endangered Species Protection

In accordance with Part 1.1.5, if the EPA Regional Office grants you a waiver from electronic reporting, you must complete the worksheet in Appendix D to select your eligibility criteria with respect to the protection of Federally listed threatened or endangered species and Federally designated "critical habitat" under the Endangered Species Act (ESA) [hereinafter "ESA-listed species and designated critical habitat(s)"] from discharges and discharge-related activities authorized under this permit.

You must submit the ESA worksheet and all required supporting documentation with this NOI. If you do not submit the worksheet and the required supporting documentation with your NOI, your NOI will be considered incomplete. After you submit your NOI and before your NOI is authorized, EPA may notify you if any additional controls are necessary to ensure your discharges are not likely to result in any short- or long-term adverse effects on ESA-listed species and critical habitat.

By indicating "Yes," I confirm that you have included the completed ESA worksheet from Appendix D and all required supporting information for your criterion selection with the submission of this NOI. ☐ Yes

SECTION IX. HISTORIC PRESERVATION

Historic Preservation

Are you installing any stormwater controls as described in Appendix E that require subsurface earth disturbance? (Appendix E, Step 1) ☐ Yes ☐ No

If yes, have prior surveys or evaluations conducted on the site have already determined historic properties do not exist, or that prior disturbances have precluded the existence of historic properties? (Appendix E, Step 2) ☐ Yes ☐ No

If no, have you determined that your installation of subsurface earth-disturbing stormwater controls will have no effect on historic properties? (Appendix E, Step 3) ☐ Yes ☐ No

If no, did the SHPO, THPO, or other Tribal representative (whichever applies) respond to you within the 15 calendar days to indicate whether the subsurface earth disturbances caused by the installation of stormwater controls affect historic properties? (Appendix E, Step 4) ☐ Yes ☐ No

If yes, describe the nature of their response:

- ☐ Written indication that no historic properties will be affected by the installation of stormwater controls.
- ☐ Written indication that adverse effects to historic properties from the installation of stormwater controls can be mitigated by agreed upon actions.
- ☐ No agreement has been reached regarding measures to mitigate effects to historic properties from the installation of stormwater controls.
- ☐ Other (Specify):

SECTION X. CERTIFICATION INFORMATION

Certification Information

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I have no personal knowledge that the information submitted is other than true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

First Name	Middle Initial	Last Name

Title

Signature	Date (MM/DD/YYYY)

Email Address

General Instructions

Who Must File an NOI Form?

Under the provisions of the Clean Water Act, as amended (33 U.S.C. 1251 et. seq.; the Act), Federal law prohibits stormwater discharges from certain construction activities to waters of the U.S. unless that discharge is covered under a National Pollutant Discharge Elimination System (NPDES) permit. Operators of construction sites where one or more acres are disturbed, smaller sites that are part of a larger common plan of development or sale where there is a cumulative disturbance of at least one acre, or any other site specifically designated by the Director, must obtain coverage under an NPDES general permit. For coverage under the 2022 CGP, each person, firm, public organization, or any other entity that meets either of the following criteria must file a Notice of Intent form: (1) they have operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or (2) they have day-to-day operational control of those activities at the project necessary to ensure compliance with the permit conditions. If you have questions about whether you need a NPDES stormwater permit, or if you need information to determine whether EPA or your State agency is the permitting authority, contact your EPA Regional Office.

Completing the Form

Obtain and read a copy of the 2022 CGP, viewable at https://www.epa.gov/npdes/stormwater-discharges-construction-activities#cgp. To complete this form, type or print uppercase letters, in the appropriate areas only. Please place each character between the marks (abbreviate if necessary to stay within the number of characters allowed for each item). Use one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions on this form, telephone EPA's NOI Processing Center at (866) 352-7755. **Please submit the original document with signature in ink - do not send a photocopied signature.**

Section I. Approval to Use Paper NOI Form

You must indicate whether you have been granted a waiver from electronic reporting from the EPA Regional Office. Note that you are not authorized to use this paper NOI form unless the EPA Regional Office has approved its use. Where you have obtained approval to use this form, indicate the waiver that you have been granted, the name of the EPA staff person who granted the waiver, and the date that approval was provided.

See https://www.epa.gov/npdes/contact-us-stormwater#regional for a list of EPA Regional Office contacts.

Section II. Permit Information

Provide the master permit number of the permit under which you are applying for coverage (see Appendix B of the general permit for the list of eligible master permit numbers)

Section III. Operator Information

Provide the legal name of the person, firm, public organization, or any other entity that operates the project described in this NOI. Refer to Appendix A of the permit for the definition of "operator".

Indicate whether you are seeking coverage under this permit as a "Federal Operator" or "Federal Facility" as defined in Appendix A.

Also provide a point of contact, the operator's mailing address, county, telephone number, and e-mail address (to be notified via e-mail of NOI approval when available). Correspondence for the NOI will be sent to this address.

If the NOI was prepared by someone other than the certifier (for example, if the NOI was prepared by the facility SWPPP contact or a consultant for the certifier's signature), include the full name, organization, phone number, and email address of the NOI preparer.

Section IV. Project/Site Information

Enter the official or legal name and complete street address, including city, State, ZIP code, and county or similar government subdivision of the project or site. If the project or site lacks a street address, indicate the general location of the site (e.g., Intersection of State Highways 61 and 34). Complete site information must be provided for permit coverage to be granted.

Provide the latitude and longitude of your facility in decimal degrees format. The latitude and longitude of your facility can be determined in several different ways, including through the use of global positioning system (GPS) receivers, U.S. Geological Survey (U.S.G.S.) topographic or quadrangle maps, and web-based siting tools, among others. For consistency, EPA requests that measurements be taken from the approximate center of the construction site. For linear construction sites, the measurement should be taken midpoint of the site. If known, enter the horizontal reference datum for your latitude and longitude. The horizontal reference datum is shown on the bottom left corner of USGS topographic maps; it is also available for GPS receivers.

Indicate whether the project is in Indian country lands or located on a property of religious or cultural significance to an Indian Tribe, and if so, provide the name of the Indian Tribe associated with the area of Indian country (including name of Indian reservation, if applicable), or if not in Indian country, provide the name of the Indian Tribe associated with the property.

Enter the estimated construction start and completion dates using four digits for the year (i.e., 10/06/2012). Indicate to the nearest quarter acre the estimated area to be disturbed. Indicate the type of construction site.

Indicate whether the pre-development land use of the site was used for agriculture Appendix A defines "agricultural land" as cropland, grassland, rangeland, pasture, and other agricultural land, on which agricultural and forest-related products or livestock are produced and resource concerns may be addressed. Agricultural lands include cropped woodland, marshes, incidental areas included in the agricultural operation, and other types of agricultural land used for the production of livestock.

Indicate whether earth-disturbing activities have already commenced on your project/site. If earth-disturbing activities have commenced on your site because stormwater discharges from the site have been previously covered under a NPDES permit, you must provide the 2017 CGP NPDES ID or

the NPDES permit number if coverage was under an individual permit.

Indicate if demolition is occurring, and if so, if the structure has at least 10,000 square feet of floor space.

Indicate if there are other operators covered under this permit for the same project site. If there are multiple operators, provide the NPDES ID number for the other operators at the site who have coverage under this permit.

Indicate whether you will be discharging dewatering water, as defined in Appendix A, during the course of the project. If you will be discharging dewatering water, indicate whether the site from which you will be dewatering is located on a current or former Federal or State remediation site. Federal remediation sites include cleanups covered by Superfund (both National Priorities List (NPL) sites and non-NPL sites), Resource Conservation and Recovery Act (RCRA) corrective actions sites, cleanups at Federal Facilities, and Federal, State, or Tribal brownfields sites. State remediation sites could include, for instance, brownfield site cleanups funded by the State, State superfund sites, and petroleum tank release sites. Operators may use online mapping resources, such as EPA's Cleanups in My Community Map, to help determine if they are located on a remediation site. The Cleanups in My Community Map is viewable at:

https://ordspub.epa.gov/ords/cimc/f?p=cimc:map::::71

Section V. Discharge Information

You must confirm that you understand that the CGP only authorizes the allowable stormwater discharges listed in Part 1.2.1 and the allowable non-stormwater discharges listed in Part 1.2.2. Any discharges not expressly authorized under the CGP are not covered by the CGP or the permit shield provision of the CWA Section 402(k) and they cannot become authorized or shielded by disclosure to EPA, State, or local authorities via the NOI to be covered by the permit or by any other means (e.g., in the SWPPP or during an inspection). If any discharges requiring NPDES permit coverage other than the allowable stormwater and non-stormwater discharges listed in Parts 1.2.1 and 1.2.2 will be discharged, they must either be eliminated or covered under another NPDES permit.

Indicate whether discharges from the site will enter into a municipal separate storm sewer system (MS4), as defined in Appendix A.

Also, indicate whether any waters of the U.S. exist within 50 feet from your site. Note that if "yes", you are required to comply with the requirement in Part 2.2.1 of the permit to provide natural buffers or equivalent erosion and sediment controls.

For each unique point of discharge you list, you must specify the name of the first water of the U.S. that receives stormwater directly from the point of discharge and/or from the MS4 that the point of discharge discharges to. You must specify whether any waters of the U.S. that you discharge to are listed as "impaired" as defined in Appendix A, and the pollutants for which the water is impaired. You must identify any Total Maximum Daily Loads (TMDL) that have been completed for any of the waters of the U.S. that you discharge to. Operators may find it useful to use EPA's Discharge Mapping Tool to determine whether the water of the U.S. is impaired, the pollutant causing the impairment, and whether a TMDL exists for the water body. The Discharge Mapping Tool is viewable at https://www.epa.gov/npdes/epas-stormwater-discharge-mapping-tools.

Indicate whether discharges from the site will enter into a water of the U.S. that is designated as a Tier 2, Tier 2.5, or Tier 3 water. A list of Tier 2, 2.5, and 3 waters is provided at https://www.epa.gov/npdes/construction-general-permit-resources-tools-and-templates. If the answer is "yes", name all waters designated as Tier 2, Tier 2.5, or Tier 3 to which the site will discharge.

Section VI. Chemical Treatment Information

Indicate whether the site will use polymers, flocculants, or other treatment chemicals. Indicate whether the site will employ cationic treatment chemicals. If the answer is "yes" to either question, indicate which chemical(s) you will use. Note that you are not eligible for coverage under this permit to use cationic treatment chemicals unless you notify your applicable EPA Regional Office in advance and the EPA office authorizes coverage under this permit after you have included appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards. If you have been authorized to use cationic treatment chemicals by your applicable EPA Regional Office, attach a copy of your authorization letter and include documentation of the appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards. Examples of cationic treatment chemicals include, but are not limited to, cationic polyacrylamide (C-PAM), PolyDADMAC (POLY DIALLYL DIMETHYL AMMONIUM CHLORIDE), and chitosan.

Section VII. Stormwater Pollution Prevention Plan (SWPPP) and Personnel Training Information

All sites eligible for coverage under this permit are required to prepare a SWPPP in advance of filing the NOI, in accordance with Part 7. Indicate whether the SWPPP has been prepared in advance of filing the NOI.

Confirm that all required personnel, including those conducting inspections at your site, will meet the training requirements in Part 6 of this permit.

Indicate the street, city, State, and ZIP code where the SWPPP can be found. Indicate the contact information (name, organization, phone, and email) for the person who developed the SWPPP for this project.

Section VIII. Endangered Species Information

Confirm that you have included the completed ESA worksheet from Appendix D and all required supporting information for your criterion selection with the submission of this NOI.

Section IX. Historic Preservation

Use the instructions in Appendix E to complete the questions on the NOI form regarding historic preservation.

Section X. Certification Information

The NOI must be signed as follows:

For a corporation: By a responsible corporate officer. For the purpose of this Section, a responsible corporate officer means:

(i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making

major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

For a municipality, State, Federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this Part, a principal executive officer of a Federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA). Include the name and title of the person signing the form and the date of signing. An unsigned or undated NOI form will not be considered eligible for permit coverage.

Modifying Your NOI

If you have been granted a waiver from your Regional Office from electronic reporting, and if after submitting your NOI you need to correct or update any fields on this NOI form, you may do so by indicating changes on this same form.

Paperwork Reduction Act Notice

This collection of information is approved by OMB under the Paperwork Reduction Act, 44 U.S.C. 3501 et seq. (OMB Control No. 2040-0305). Responses to this collection of information are mandatory (40 CFR 122.26). An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The public reporting and recordkeeping burden for this collection of information is estimated to be 3.3 hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates and any suggested methods for minimizing respondent burden to the Regulatory Support Division Director, U.S. Environmental Protection Agency (2821T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

Submitting Your Form

Submit your NOI form by mail to one of the following addresses:

For Regular U.S. Mail Delivery:
Stormwater Notice Processing Center
Mail Code 4203M, ATTN: 2022 CGP
U.S. EPA
1200 Pennsylvania Avenue, NW
Washington, DC 20460

For Overnight/Express Mail Delivery:
Stormwater Notice Processing Center
William Jefferson Clinton East Building - Room 7420
ATTN: 2022 CGP
U.S. EPA
1201 Constitution Avenue, NW
Washington, DC 20004

Visit this website for instructions on how to submit electronically:

https://www.epa.gov/npdes/stormwater-discharges-construction-activities#ereporting

Appendix I - Notice of Termination (NOT) Form and Instructions

Part 8.3 requires you to use the NPDES eReporting Tool, or "NeT" system, to prepare and submit your NOT electronically. However, if the EPA Regional Office grants you a waiver to use a paper NOT form, and you elect to use it, you must complete and submit the following form.

NPDES Form 3510-13	EPA	U.S. Environmental Protection Agency Washington, DC 20460 Notice of Termination for the 2022 NPDES Construction General Permit	OMB No. 2040-0305 Exp. Date 01/31/2025

Submission of this Notice of Termination constitutes notice that the operator identified in Section III of this form is no longer authorized discharge pursuant to the NPDES Construction General Permit (CGP) from the site identified in Section IV of this form. All necessary information must be included on this form. Refer to the instructions at the end of this form.

SECTION I. APPROVAL TO USE PAPER NOI FORM

Paper NOI Form

Have you been granted a waiver from electronic reporting from the Regional Office*? ☐ Yes ☐ No

If yes, check which waiver you have been granted, the name of the EPA Regional Office staff person who granted the waiver, and the date of approval:

Waiver granted:

☐ The owner/operator's headquarters is physically located in a geographic area (i.e., ZIP code or census tract) that is identified as under-served for broadband Internet access in the most recent report from the Federal Communications Commission.

☐ The owner/operator has issues regarding available computer access or computer capability.

Name of EPA staff person that granted the waiver	Date approval obtained (MM/DD/YYYY)

*** Note: You are required to obtain approval from the applicable Regional Office prior to using this paper NOI form. If you have not obtained a waiver, you must file this form electronically using the NPDES eReporting Tool (NeT).**

SECTION II. PERMIT INFORMATION

Permit

NPDES ID

Reason for Termination (Check only one):

☒ You have completed all construction activities at your site, and you have met all other requirements in Part 8.2.1.

Check this box to confirm that you have attached photographs as required by Part 8.2.1.a that document your compliance with the permit's final stabilization requirements.

Include the date each photograph was taken, and a brief description of the area of the site captured by the photograph (e.g., photo shows application of seed and erosion control mats to remaining exposed surfaces on northeast corner of site).

☐ If any portion of your site is covered by one of the Part 2.2.14c.iii exceptions to the final stabilization criteria, indicate which exception applies and include a supplementary explanation with your photographs that provides the necessary context for why this portion of the site is in compliance even though it appears to be unstabilized.

☒ Another operator has assumed control over all areas of the site and that operator has submitted an NOI and obtained coverage under the CGP.

☒ You have obtained coverage under an individual permit or another general NPDES permit addressing stormwater discharges from the construction site.

SECTION III. OPERATOR INFORMATION

Operator Information

Operator Name

Mailing Address

Street

City	State	ZIP Code

County or Similar Government Division

Phone Number	Email Address

SECTION IV. PROJECT/SITE INFORMATION

Project/Site Address

Project/Site Name		
Street/Location		
City	State	ZIP Code
County or Similar Government Division:		

SECTION V. CERTIFICATION INFORMATION

Certification Information

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

First Name	Middle Initial	Last Name
Title		
Signature		Date (MM/DD/YYYY)
Email Address		

General Instructions

Who May File an NOT Form?

Permittees who are presently covered under the EPA-issued 2022 Construction General Permit (CGP) for Stormwater Discharges Associated with Construction Activity may submit an NOT form when: (1) earth-disturbing activities at the site are completed and the conditions in Parts 8.2.1.a through 8.2.1.b are met; or (2) the permittee has transferred all areas under its control to another operator, and that operator has submitted and obtained coverage under this permit; or (3) the permittee has obtained coverage under a different NPDES permit for the same discharges.

Completing the Form

Type or print, using uppercase letters, in the appropriate areas only. Please place each character between the marks. Abbreviate if necessary to stay within the number of characters allowed for each item. Use only one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions about this form, refer to https://www.epa.gov/npdes/stormwater-discharges-construction-activities#cgp or telephone EPA's NOI Processing Center at (866) 352-7755. **Please submit original document with signature in ink - do not send a photocopied signature.**

Section I. Approval to Use Paper NOI Form

You must indicate whether you have been granted a waiver from electronic reporting from the EPA Regional Office. Note that you are not authorized to use this paper NOT form unless the EPA Regional Office has approved its use. Where you have obtained approval to use this form, indicate the waiver that you have been granted, the name of the EPA staff person who granted the waiver, and the date that approval was provided.

See https://www.epa.gov/npdes/contact-us-stormwater#regional for a list of EPA Regional Office contacts.

Section II. Permit Information

Enter the existing NPDES ID assigned to the project . If you do not know the NPDES ID number, or contact EPA's NOI Processing Center at (866) 352-7755.

Indicate your reason for submitting this Notice of Termination by checking the appropriate box. Check only one. If you selected the first box, confirm that you have attached photographs as required by Part 8.2.1.a. All submitted photographs must: (1) be taken both before and after the site has met the final stabilization criteria in Part 2.2.14.c; (2) be clear and in focus, and in the original format and resolution; and (3) include the date each photograph was taken, and a brief description of the area of the site captured by the photograph (e.g., photo shows application of seed and erosion control mats to remaining exposed surfaces on northeast corner of site).

If any portion of your site is covered by one of the Part 2.2.14c.iii final stabilization exceptions, indicate which exception applies and provide an explanation with your photographs that describes why this portion of the site is in compliance even though it may appear to be unstabilized.

Section III. Operator Information

Provide the legal name of the person, firm, public organization, or any other entity that operates the project described in this NOT and is covered by the NPDES ID identified in Section II. Enter the complete mailing address, telephone number, and email address of the operator.

Section IV. Project/Site Information

Enter the official or legal name and complete street address, including city, State, ZIP code, and county or similar government subdivision of the project or site. If the project or site lacks a street address, indicate the general location of the site (e.g., Intersection of State Highways 61 and 34). Complete site information must be provided for termination of permit coverage to be valid.

Section V. Certification Information

The NOT, must be signed as follows:

For a corporation: By a responsible corporate officer. For the purpose of this Part, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy-or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

For a municipality, State, Federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this Part, a principal executive officer of a Federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

Include the name, title, and email address of the person signing the form and the date of signing. An unsigned or undated NOT form will not be considered valid termination of permit coverage.

Paperwork Reduction Act Notice

This collection of information is approved by OMB under the Paperwork Reduction Act, 44 U.S.C. 3501 et seq. (OMB Control No. 2040-0305). Responses to this collection of information are mandatory (40 CFR 122.26). An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a

currently valid OMB control number. The public reporting and recordkeeping burden for this collection of information is estimated to be 1.2 hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates and any suggested methods for minimizing respondent burden to the Regulatory Support Division Director, U.S. Environmental Protection Agency (2821T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

Submitting Your Form

Submit your NOT form by mail to one of the following addresses:

For Regular U.S. Mail Delivery:
Stormwater Notice Processing Center
Mail Code 4203M, ATTN: 2022 CGP
U.S. EPA
1200 Pennsylvania Avenue, NW
Washington, DC 20460

For Overnight/Express Mail Delivery:
Stormwater Notice Processing Center
William Jefferson Clinton East Building - Room 7420
ATTN: 2022 CGP
U.S. EPA
1201 Constitution Avenue, NW
Washington, DC 20004

Visit this website for instructions on how to submit electronically:

https://www.epa.gov/npdes/stormwater-discharges-construction-activities#ereporting

Appendix J - Suggested Format for Request for Chemical Treatment

If you plan to add "cationic treatment chemicals" (as defined in Appendix A) to stormwater and/or authorized non-stormwater prior to discharge, Part 1.1.9 requires you to notify your applicable EPA Regional Office in advance of submitting your NOI. The EPA Regional Office will authorize coverage under this permit after you have included appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will result in discharges that meet applicable water quality standards. To notify your EPA Regional Office, you may use following form.

NPDES Form 6100-066	EPA	U.S. Environmental Protection Agency Washington, DC 20460 Suggested Form for Notifying EPA about Proposed Use of Cationic Treatment Chemicals under the 2022 NPDES Construction General Permit	OMB No. 2040-0305 Exp. Date 01/31/2025

Under Part 1.1.9 of the 2022 CGP, if you plan to add "cationic treatment chemicals" (as defined in Appendix A) to stormwater and/or authorized non-stormwater prior to discharge, you may not submit your Notice of Intent (NOI) until you notify your applicable EPA Regional Office in advance and the EPA Regional Office authorizes coverage under this permit after you have included appropriate controls and implementation procedures designed to ensure that your use of cationic treatment chemicals will result in discharges that meet applicable water quality standards. You may use this suggested form to notify your EPA Regional Office about your proposed use of cationic treatment chemicals.

SECTION I. OPERATOR INFORMATION

Operator Information

Operator Name		
Mailing Address		
Street		
City	State	ZIP Code
County or Similar Government Division		
Phone Number	Email Address	

SECTION II. PROJECT/SITE INFORMATION

Project/Site Information

Project/Site Name		
Project/Site Address		
Street/Location		
City	State	ZIP Code
County or Similar Government Division		
Site Contact Information (if different from operator)		
First Name	Middle Initial	Last Name
Phone Number		
Receiving Waterbodies		
Name(s) of Receiving Waterbodies:		

SECTION III. MAP

Map

Attach a map that illustrates the entire site including all of the below items. Include this map in your Stormwater Pollution Prevention Plan (SWPPP).
- All receiving waterbodies
- All proposed location(s) of chemical treatment system(s)
- All proposed point(s) of discharge to receiving waterbodies
- All soil types within areas to be disturbed
- All areas of earth disturbance
- Sufficient indication of topography to indicate where stormwater flows

Attach a schematic drawing of the proposed treatment system(s). Include all components of the treatment train, sample points, and pipe configurations. In addition to sufficient holding capacity upstream of treatment, the system must have the capacity to hold water for testing and to re-treat water that does not meet water quality standards.

SECTION IV. RESPONSIBLE PERSONNEL

Responsible Personnel

Treatment System Operator or Company Name (if subcontracted out):		
Street/Location		
City	State	ZIP Code

Responsible Personnel	
List personnel who will be responsible for operating the chemical treatment systems and application of the chemicals.	Cite the training that the personnel have received in operation and maintenance of the treatment system(s) and use of the specific chemical(s) proposed.

SECTION V. PROPOSED TREATMENT

Proposed Treatment

Check proposed treatment system to be used:	☐ Chitosan enhanced sand filtration with discharge to infiltration (ground water).
	☐ Chitosan enhanced sand filtration with discharge to temporary holding ponds (batch).
	☐ Chitosan enhanced sand filtration with discharge to surface waters (flow-through).
	☐ Other (describe below and submit documentation that the proposed system and chemical(s) demonstrate the ability to remove turbidity and produce non-toxic effluent/discharge):
Check proposed cationic chemical(s) to be used:	☐ FlocClear™ (2% chitosan acetate solution).
	☐ StormKlear™ LiquiFloc™ (1% chitosan acetate solution).
	☐ ChitoVan™ (1% chitosan acetate solution).
	☐ StormKlear™ LiquiFloc™ (3% chitosan acetate solution).
	☐ Other (Specify):

Estimated Treatment Period Start Date (MM/DD/YYYY)	Estimated Treatment Period End Date (MM/DD/YYYY)

Describe sampling and recordkeeping schedule. Attach additional sheets as needed:

Proposed Treatment

Explain why you have selected this proposed treatment system and chemicals. Include an explanation of why the use of cationic treatment chemicals is necessary at the site. Reference how the soil types on your site influenced your choices. Describe or provide an illustration of how the site of the discharge will be stabilized and why the discharge location will not cause erosion of the discharge water's bank or bed (please note that a permit from the Corps and State agencies may be necessary to place rock in the water body for this stabilization). Attach as many additional sheets as needed for a full explanation. If you have a report from a chemical treatment contractor describing their recommended approach you may attach that.

SECTION VI. CERTIFICATION INFORMATION

Certification Information

I have documented and hereby certify that the following information is correct and has been documented in the SWPPP for this project:

- The SWPPP includes a complete site-specific description of the chemical treatment system herein proposed for use, including specifications, design, and Material Safety Data Sheets for all chemicals to be used.
- The controls to be used on the site are compatible with the safe and effective use of cationic chemical treatment.
- I verified through jar tests that the site soil is conducive to chemical treatment.
- I verified that the chemical treatment system operators for this project received training.
- I read, understand, and will follow all conditions and design criteria in the applicable use designation(s).
- If the discharge is to Tribal waters, I notified the appropriate Tribal government of the intent to use chemical treatment on a site located within that jurisdiction.
- I will keep the use level designation, operation and maintenance manual, and training certificate on site prior to and during use of chemical treatment.
- A licensed engineer designed the system for this project including system sizing, pond sizing, and flow requirements.
- I verify that the discharge will not adversely affect downstream conveyance systems or stream channels (e.g., cause erosion).

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Authorized Official

First Name	Middle Initial	Last Name

Title

Signature	Date (MM/DD/YYYY)

Email Address

Section I. Operator Information

Provide the legal name of the person, firm, public organization, or any other entity that operates the project. Refer to Appendix A of the permit for the definition of "operator." Provide the operator's mailing address, county, telephone number, and e-mail address.

Section II. Project/Site Information

Enter the official or legal name and complete street address, including city, State, ZIP code, and county or similar government subdivision of the project or site. If the project or site lacks a street address, indicate the general location of the site (e.g., Intersection of State Highways 61 and 34).

Provide site contact information, if different from the operator.

Provide the name of the receiving waterbodies to which your site/project will discharge.

Section III. Map

Attach a map of the entire site that includes the identified items. Attach a schematic of the proposed treatment system(s) that includes the identified items.

Section IV. Responsible Personnel

Provide the legal name of the treatment system operator or company and complete street address, including city, State, including city, State, and ZIP code.

List personnel who will be responsible for operating the chemical treatment systems and application of the chemicals. For each personnel listed, cite the training that the personnel have received in operation and maintenance of the treatment system(s) and use of the specific chemical(s) proposed.

Section V. Proposed Treatment

Indicate the proposed treatment system and proposed cationic chemicals to be used. Indicate the estimated treatment start and end dates. Describe the sampling and recordkeeping schedule. Explain why you have selected the proposed treatment system and chemicals.

Section VI. Certification Information

The form must be signed as follows:

For a corporation: By a responsible corporate officer. For the purpose of this Section, a responsible corporate officer means:

(i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

For a municipality, State, Federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this Part, a principal executive officer of a Federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA). Include the name and title of the person signing the form and the date of signing.

Submitting Your Form

Submit this form to your applicable EPA Regional Office. Contact information can be found at: https://www.epa.gov/npdes/contact-us-stormwater#regional

Appendix K – Turbidity Monitoring Report Form and Instructions

Part 3.3 requires you to use the EPA NPDES eReporting Tool, or "NeT" system, to prepare and submit your report electronically. However, if the EPA Regional Office grants you a waiver to use a paper form, and you elect to use it, you must complete and submit the following form.

NPDES Form 6100-065	EPA	U.S. Environmental Protection Agency Washington, DC 20460 Turbidity Monitoring Report Form for Dewatering Discharges to Sensitive Waters Under the 2022 NPDES Construction General Permit	OMB No. 2040-0305 Exp. Date 01/31/2025

SECTION I. APPROVAL TO USE PAPER FORM

Paper Form

Have you been granted a waiver from electronic reporting from the Regional Office*? ☐ Yes ☐ No

If yes, check which waiver you have been granted, and provide the name of the EPA Regional Office staff person who granted the waiver, and the date of approval:

Waiver granted:

☐ The owner/operator's headquarters is physically located in a geographic area (i.e., ZIP code or census tract) that is identified as under-served for broadband Internet access in the most recent report from the Federal Communications Commission.

☐ The owner/operator has issues regarding available computer access or computer capability.

Name of EPA staff person that granted the waiver	Date approval obtained (MM/DD/YYYY)

*** Note: You are required to obtain approval from the applicable Regional Office prior to using this paper form. If you have not obtained a waiver, you must file this form electronically using the NPDES eReporting Tool (NeT).**

SECTION II. PERMIT INFORMATION

Permit

NPDES ID

Does this report fulfill turbidity monitoring report obligations of other operators that are covered under this permit for the same project site? ☐ Yes ☐ No

If yes, provide the NPDES ID number(s) for all other such operators at the same project site: _____

SECTION III. OPERATOR INFORMATION

Operator Information

Operator Name

Mailing Address

Street

City	State	ZIP Code

County or Similar Government Division:

Phone Number	Email Address

Preparer

Complete if form was prepared by someone other than the certifier:

First Name	Middle Initial	Last Name

Organization

Phone Number	Email Address

SECTION IV. SITE INFORMATION

Site Address

Site Name

Site Address

Street/Location

City	State	ZIP Code

County or Similar Government Division:

SECTION IV. MONITORING QUARTER

Monitoring Quarter

Identify monitoring quarter (select only one):

- ☐ Quarter 1 (January 1 – March 31)
- ☐ Quarter 2 (April 1 – June 30)
- ☐ Quarter 3 (July 1 – September 30)
- ☐ Quarter 4 (October 1 – December 31)

SECTION IVI. TURBIDITY MONITORING DATA

Turbidity Monitoring Data

Discharge Point Description/ Name:

Was dewatering water discharged during the monitoring quarter? ☐ Yes (Enter the data below) ☐ No (Skip to Section VII)

Specific Week within Monitoring Quarter[1]	Weekly Average (NTU)[2]	Benchmark Threshold (NTU)	Alternate Benchmark Threshold (NTU)[3]	Average exceeds Benchmark?[4]
Week 1		50		☐ Yes ☐ No
Week 2		50		☐ Yes ☐ No
Week 3		50		☐ Yes ☐ No
Week 4		50		☐ Yes ☐ No
Week 5		50		☐ Yes ☐ No
Week 6		50		☐ Yes ☐ No
Week 7		50		☐ Yes ☐ No
Week 8		50		☐ Yes ☐ No
Week 9		50		☐ Yes ☐ No
Week 10		50		☐ Yes ☐ No
Week 11		50		☐ Yes ☐ No
Week 12		50		☐ Yes ☐ No
Week 13		50		☐ Yes ☐ No
Week 14		50		☐ Yes ☐ No

[1] Refer to Table K-1 to determine the specific monitoring week number for which you are reporting turbidity data for this quarter.

[2] Report to the nearest whole number. Enter "N/A" if no dewatering discharge occurred during any particular week.

[3] Prior approval from the EPA Regional Office is required pursuant to Part 3.3.2.b. Unless and until EPA approves your request to use an alternate benchmark, you are required to use the standard benchmark of 50 NTU and take any required corrective actions if an exceedance occurs. Enter "N/A" if you have not received approval for an alternate benchmark threshold.

[4] If "Yes," the operator must conduct follow-up corrective action pursuant to Part 5.2.2 and document any corrective action taken in the corrective action log in accordance with Part 5.4.

VII. CERTIFICATION INFORMATION

Certification Information

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

First Name	Middle Initial	Last Name

Title

Signature	Date (MM/DD/YYYY)

Phone Number	Email Address

General Instructions

Who Must Submit A Turbidity Monitoring Report to EPA?

Sites covered under the Construction General Permit (CGP or permit) that are required to monitor pursuant to Part 3.3 of the permit must submit Turbidity Monitoring Reports consistent with the reporting requirements specified in Part 3.3.4 of the permit.

When Must I Submit A Turbidity Monitoring Report to EPA?

You must submit your report to EPA no later than 30 days following the end of each monitoring quarter. Submit a form for every quarter the site is active.

Monitoring Quarter #	Months	Reporting Deadline
1	January 1 – March 31	April 30
2	April 1 – June 30	July 30
3	July 1 – September 30	October 30
4	October 1 – December 31	January 30

Completing the Form

Obtain and read a copy of the 2022 CGP, viewable at https://www.epa.gov/npdes/stormwater-discharges-construction-activities#cgp. To complete this form, type or print, using uppercase letters, in the appropriate areas only. Please submit the original document with signature in ink - do not send a photocopied signature. **Photocopy your form for your records before you send the completed original form to the appropriate address.**

Section I. Approval to Use Paper Form

You must indicate whether you have been granted a waiver from electronic reporting from the EPA Regional Office. Note that you are not authorized to use this paper form unless the EPA Regional Office has approved its use. Where you have obtained approval to use this form, indicate the waiver that you have been granted, the name of the EPA staff person who granted the waiver, and the date that approval was provided. See https://www.epa.gov/npdes/contact-us-stormwater for a list of EPA Regional Office contacts.

Section II. Permit Information

Provide the NPDES ID (i.e., NOI tracking number) assigned to the site for which this form is being submitted. Submit the form only for sites discharging dewatering water to a sediment-impaired water or a water designated as a Tier 2, Tier 2.5, or Tier 3 water.

Indicate whether this report fulfills turbidity monitoring report obligations of other operators that are covered under this permit for the same project site. If the answer is yes, provide all relevant NPDES ID numbers.

Section III. Operator Information

Provide the legal name of the person, firm, public organization, or any other entity that is considered the operator of the site. See Part 1.1.1 and Appendix A for the definition of "operator." Provide the operator's mailing address, phone number, and e-mail. The operator information in this Section should match the operator information provided on your NOI form.

If this form was prepared by someone other than the certifier, include the name, organization, phone number, and email address of the person who prepared this form.

Section IV. Site Information

Enter the official or legal name and complete street address, including city, State, ZIP code, and county or similar government subdivision of the site. If the site lacks a street address, indicate the general location (e.g., Intersection of State Highways 61 and 34). The site information in this Section should match the site information provided on your NOI form.

Section V. Monitoring Quarter

Indicate the appropriate monitoring quarter (Quarter 1, 2, 3, or 4). The monitoring quarters are specified in the table in the section titled "When Must I Submit A Turbidity Monitoring Report to EPA." Select only one quarter.

Section VI. Turbidity Monitoring Data

Provide the discharge point description/name if you are discharging dewatering water from more than one point at the site. If you are discharging from only one point at the site, leave the spaces blank.

Submit Section VI data for each dewatering discharge point. For example, if you are discharging dewatering water from two points at the site, then submit two Section VIs (one for each discharge point).

Indicate whether dewatering occurred during the monitoring quarter. If "Yes" enter the data in the data table. If "No" skip to Section VII.

For averaging purposes, a monitoring week starts with a Monday and ends on Sunday. A numerical value is assigned for each week, which is called a Week Number (e.g., 1, 2, 3 etc.). The form includes a Week Number for each week of the year. Refer to Table K-1 for the dates that correspond with each Week Number.

Next, calculate the weekly average turbidity value for the corresponding monitoring week. The weekly average is calculated by adding all of the individual turbidity results for that monitoring week and dividing by the total number of samples. The calculation for the weekly average includes only those days when dewatering discharge occurred. Days when no dewatering discharge occurred, and therefore do not have turbidity data associated with them, are not included in the calculation of the weekly average. For example, if turbidity samples from your dewatering discharge in week 1 result in values of 30 NTU on Tuesday, 40 NTU on Wednesday, and 45 NTU on Thursday, your weekly average turbidity value would be 38 NTU ((30+40+45) ÷ 3 = 38 NTU). If in week 2, your turbidity samples resulted in values of 45 NTU on Monday, 30 NTU on Tuesday, 25 NTU on Wednesday, and 15 NTU on Thursday, you would calculate a new average for that week, which would yield an average turbidity value of 29 NTU ((45+30+25+15) ÷ 4 = 29 NTU). By comparison, if your samples on consecutive days from Friday to Monday were 60

NTU, 45 NTU, 40 NTU, and 43 NTU, respectively, and there are no other dewatering discharges for the remainder of the week, you would calculate one weekly average for the Friday to Sunday to be 48 NTU ((60+45+40) ÷ 3 = 48 NTU), and a separate weekly average for the one Monday to be 43 NTU (43 ÷ 1 = 43 NTU).

If you collect and analyze more than one turbidity sample per day from your dewatering discharge, you must include any additional results in the calculation of your weekly average. For example, if during a monitoring week you take two turbidity samples on Tuesday with a value of 30 NTU and 35 NTU, three samples on Wednesday with a value of 40 NTU, 45 NTU, and 48 NTU, and one sample on Thursday with a value of 45 NTU, your weekly average turbidity value for this week would be 41 NTU ((30+35+40+45+48+45) ÷ 6 = 41 NTU).

Enter the weekly average turbidity values for the corresponding week into the table. Enter "N/A" into the table for the turbidity weekly average if no dewatering discharge occurred during the week.

The benchmark threshold for turbidity for this permit is 50 NTUs unless EPA has authorized the use of an alternate benchmark in accordance with Part 3.3.2.b. If you are using an alternate benchmark threshold, enter the number into the table for the corresponding week. Unless and until EPA approves your request to use an alternate benchmark, you are required to use the standard benchmark of 50 NTU and take any required corrective actions if an exceedance occurs. Enter "N/A" if you have not received approval for an alternate benchmark threshold.

For each week with a value for the weekly average, select "Yes" or "No" in the table to indicate whether the weekly average value exceeds the 50 NTU benchmark or the alternate turbidity benchmark (whichever is applicable). If "Yes", the operator must conduct follow-up corrective action pursuant to Part 5.2.2 and document any corrective action taken in the corrective action log in accordance with Part 5.4.

Section VII. Certification Information

Forms must be signed by a person described below, or by a duly authorized representative of that person.

For a corporation: By a responsible corporate officer. For the purpose of this Section, a responsible corporate officer means:

(i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

For a municipality, State, Federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this Part, a principal executive officer of a Federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA). Include the name and title of the person signing the form and the date of signing.

A person is a duly authorized representative only if:

1. The authorization is made in writing by a person described above;

2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company, (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) and

3. The written authorization is submitted to the Director.

An unsigned or undated form will be considered incomplete.

Submitting Your Form

If you have been granted a waiver from your Regional Office to submit a paper form, you must send your form by mail to one of the following addresses:

For Regular U.S. Mail Delivery:

Stormwater Notice Processing Center
Mail Code 4203M, ATTN: 2022 CGP Reports
U.S. EPA
1200 Pennsylvania Avenue, NW
Washington, DC 20460

For Overnight/Express Mail Delivery:

Stormwater Notice Processing Center
William Jefferson Clinton East Building - Room 7420
ATTN: 2022 CGP Reports
U.S. EPA
1201 Constitution Avenue, NW
Washington, DC 20004

Visit this website for instructions on how to submit electronically:

https://epanet.zendesk.com/hc/en-us/sections/115000949868-CGP-Training-Material

Revisions to a Submitted Form

If you have previously submitted a form with an error, submit a revised form with the correct information. After discovering the error, submit the revised form as soon as possible. Make a notation on the revised form where the correction was made.

Paperwork Reduction Act Notice

This collection of information is approved by OMB under the Paperwork Reduction Act, 44 U.S.C. 3501 et seq. (OMB Control No. 2040-0305). Responses to this collection of information are mandatory (40 CFR 122.26). An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The public reporting and recordkeeping burden for this collection of information is

estimated to be 0.2 hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates and any suggested methods for minimizing respondent burden to the Regulatory Support Division Director, U.S. Environmental Protection Agency (2821T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

Table K-1: 2022 CGP - Dates Corresponding to Monitoring Weeks for Each Monitoring Quarter

2022			
Monitoring Quarter	Week #	*Monday* Start Date	*Sunday* End Date
1	1	1/3/22	1/9/22
	2	1/10/22	1/16/22
	3	1/17/22	1/23/22
	4	1/24/22	1/30/22
	5	1/31/22	2/6/22
	6	2/7/22	2/13/22
	7	2/14/22	2/20/22
	8	2/21/22	2/27/22
	9	2/28/22	3/6/22
	10	3/7/22	3/13/22
	11	3/14/22	3/20/22
	12	3/21/22	3/27/22
	13	3/28/22	4/3/22
2	1	4/4/22	4/10/22
	2	4/11/22	4/17/22
	3	4/18/22	4/24/22
	4	4/25/22	5/1/22
	5	5/2/22	5/8/22
	6	5/9/22	5/15/22
	7	5/16/22	5/22/22
	8	5/23/22	5/29/22
	9	5/30/22	6/5/22
	10	6/6/22	6/12/22
	11	6/13/22	6/19/22
	12	6/20/22	6/26/22
	13	6/27/22	7/3/22
3	1	7/4/22	7/10/22
	2	7/11/22	7/17/22
	3	7/18/22	7/24/22
	4	7/25/22	7/31/22
	5	8/1/22	8/7/22
	6	8/8/22	8/14/22
	7	8/15/22	8/21/22
	8	8/22/22	8/28/22
	9	8/29/22	9/4/22
	10	9/5/22	9/11/22
	11	9/12/22	9/18/22
	12	9/19/22	9/25/22
	13	9/26/22	10/2/22
4	1	10/3/22	10/9/22
	2	10/10/22	10/16/22
	3	10/17/22	10/23/22
	4	10/24/22	10/30/22
	5	10/31/22	11/6/22
	6	11/7/22	11/13/22
	7	11/14/22	11/20/22
	8	11/21/22	11/27/22
	9	11/28/22	12/4/22
	10	12/5/22	12/11/22
	11	12/12/22	12/18/22
	12	12/19/22	12/25/22
	13	12/26/22	1/1/23

2023			
Monitoring Quarter	Week #	*Monday* Start Date	*Sunday* End Date
1	1	1/2/23	1/8/23
	2	1/9/23	1/15/23
	3	1/16/23	1/22/23
	4	1/23/23	1/29/23
	5	1/30/23	2/5/23
	6	2/6/23	2/12/23
	7	2/13/23	2/19/23
	8	2/20/23	2/26/23
	9	2/27/23	3/5/23
	10	3/6/23	3/12/23
	11	3/13/23	3/19/23
	12	3/20/23	3/26/23
	13	3/27/23	4/2/23
2	1	4/3/23	4/9/23
	2	4/10/23	4/16/23
	3	4/17/23	4/23/23
	4	4/24/23	4/30/23
	5	5/1/23	5/7/23
	6	5/8/23	5/14/23
	7	5/15/23	5/21/23
	8	5/22/23	5/28/23
	9	5/29/23	6/4/23
	10	6/5/23	6/11/23
	11	6/12/23	6/18/23
	12	6/19/23	6/25/23
	13	6/26/23	7/2/23
3	1	7/3/23	7/9/23
	2	7/10/23	7/16/23
	3	7/17/23	7/23/23
	4	7/24/23	7/30/23
	5	7/31/23	8/6/23
	6	8/7/23	8/13/23
	7	8/14/23	8/20/23
	8	8/21/23	8/27/23
	9	8/28/23	9/3/23
	10	9/4/23	9/10/23
	11	9/11/23	9/17/23
	12	9/18/23	9/24/23
	13	9/25/23	10/1/23
4	1	10/2/23	10/8/23
	2	10/9/23	10/15/23
	3	10/16/23	10/22/23
	4	10/23/23	10/29/23
	5	10/30/23	11/5/23
	6	11/6/23	11/12/23
	7	11/13/23	11/19/23
	8	11/20/23	11/26/23
	9	11/27/23	12/3/23
	10	12/4/23	12/10/23
	11	12/11/23	12/17/23
	12	12/18/23	12/24/23
	13	12/25/23	12/31/23

2024			
Monitoring Quarter	Week #	*Monday* Start Date	*Sunday* End Date
1	1	1/1/24	1/7/24
	2	1/8/24	1/14/24
	3	1/15/24	1/21/24
	4	1/22/24	1/28/24
	5	1/29/24	2/4/24
	6	2/5/24	2/11/24
	7	2/12/24	2/18/24
	8	2/19/24	2/25/24
	9	2/26/24	3/3/24
	10	3/4/24	3/10/24
	11	3/11/24	3/17/24
	12	3/18/24	3/24/24
	13	3/25/24	3/31/24
2	1	4/1/24	4/7/24
	2	4/8/24	4/14/24
	3	4/15/24	4/21/24
	4	4/22/24	4/28/24
	5	4/29/24	5/5/24
	6	5/6/24	5/12/24
	7	5/13/24	5/19/24
	8	5/20/24	5/26/24
	9	5/27/24	6/2/24
	10	6/3/24	6/9/24
	11	6/10/24	6/16/24
	12	6/17/24	6/23/24
	13	6/24/24	6/30/24
3	1	7/1/24	7/7/24
	2	7/8/24	7/14/24
	3	7/15/24	7/21/24
	4	7/22/24	7/28/24
	5	7/29/24	8/4/24
	6	8/5/24	8/11/24
	7	8/12/24	8/18/24
	8	8/19/24	8/25/24
	9	8/26/24	9/1/24
	10	9/2/24	9/8/24
	11	9/9/24	9/15/24
	12	9/16/24	9/22/24
	13	9/23/24	9/29/24
	14	9/30/24	10/6/24
4	1	10/7/24	10/13/24
	2	10/14/24	10/20/24
	3	10/21/24	10/27/24
	4	10/28/24	11/3/24
	5	11/4/24	11/10/24
	6	11/11/24	11/17/24
	7	11/18/24	11/24/24
	8	11/25/24	12/1/24
	9	12/2/24	12/8/24
	10	12/9/24	12/15/24
	11	12/16/24	12/22/24
	12	12/23/24	12/29/24
	13	12/30/24	1/5/25

2025			
Monitoring Quarter	Week #	*Monday* Start Date	*Sunday* End Date
1	1	1/6/25	1/12/25
	2	1/13/25	1/19/25
	3	1/20/25	1/26/25
	4	1/27/25	2/2/25
	5	2/3/25	2/9/25
	6	2/10/25	2/16/25
	7	2/17/25	2/23/25
	8	2/24/25	3/2/25
	9	3/3/25	3/9/25
	10	3/10/25	3/16/25
	11	3/17/25	3/23/25
	12	3/24/25	3/30/25
	13	3/31/25	4/6/25
2	1	4/7/25	4/13/25
	2	4/14/25	4/20/25
	3	4/21/25	4/27/25
	4	4/28/25	5/4/25
	5	5/5/25	5/11/25
	6	5/12/25	5/18/25
	7	5/19/25	5/25/25
	8	5/26/25	6/1/25
	9	6/2/25	6/8/25
	10	6/9/25	6/15/25
	11	6/16/25	6/22/25
	12	6/23/25	6/29/25
	13	6/30/25	7/6/25
3	1	7/7/25	7/13/25
	2	7/14/25	7/20/25
	3	7/21/25	7/27/25
	4	7/28/25	8/3/25
	5	8/4/25	8/10/25
	6	8/11/25	8/17/25
	7	8/18/25	8/24/25
	8	8/25/25	8/31/25
	9	9/1/25	9/7/25
	10	9/8/25	9/14/25
	11	9/15/25	9/21/25
	12	9/22/25	9/28/25
	13	9/29/25	10/5/25
4	1	10/6/25	10/12/25
	2	10/13/25	10/19/25
	3	10/20/25	10/26/25
	4	10/27/25	11/2/25
	5	11/3/25	11/9/25
	6	11/10/25	11/16/25
	7	11/17/25	11/23/25
	8	11/24/25	11/30/25
	9	12/1/25	12/7/25
	10	12/8/25	12/14/25
	11	12/15/25	12/21/25
	12	12/22/25	12/28/25
	13	12/29/25	1/4/26

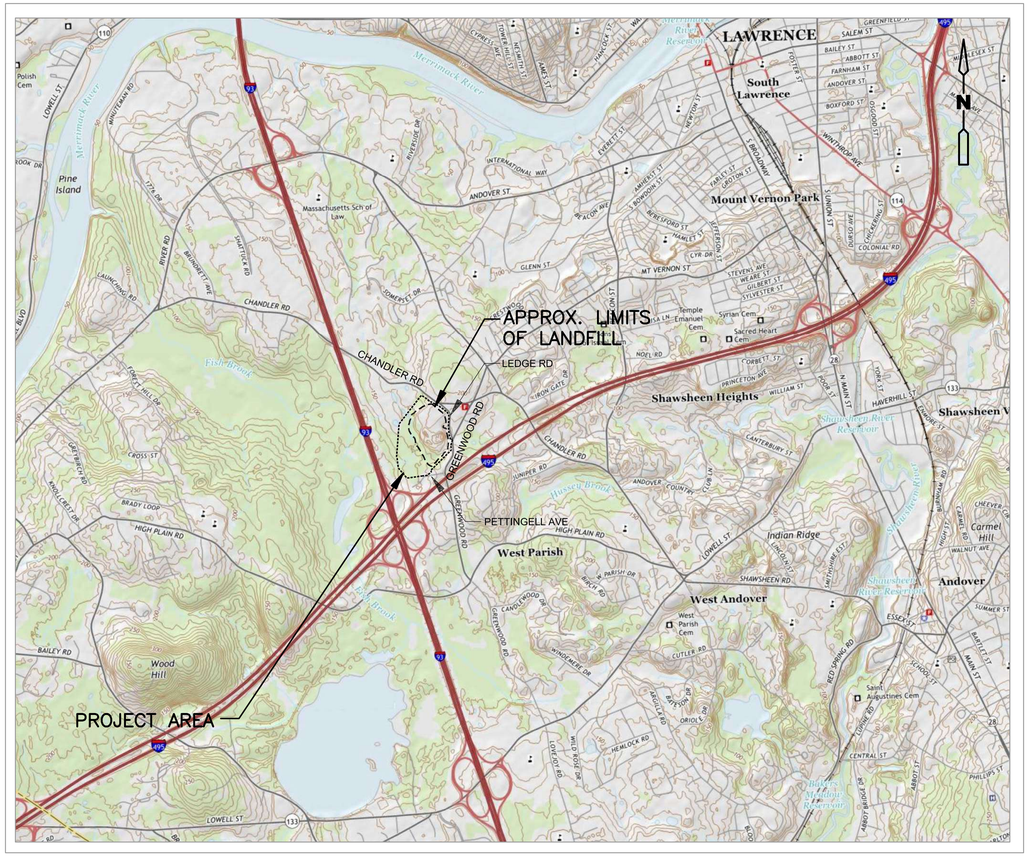
2026			
Monitoring Quarter	Week #	*Monday* Start Date	*Sunday* End Date
1	1	1/5/26	1/11/26
	2	1/12/26	1/18/26
	3	1/19/26	1/25/26
	4	1/26/26	2/1/26
	5	2/2/26	2/8/26
	6	2/9/26	2/15/26
	7	2/16/26	2/22/26
	8	2/23/26	3/1/26
	9	3/2/26	3/8/26
	10	3/9/26	3/15/26
	11	3/16/26	3/22/26
	12	3/23/26	3/29/26
	13	3/30/26	4/5/26
2	1	4/6/26	4/12/26
	2	4/13/26	4/19/26
	3	4/20/26	4/26/26
	4	4/27/26	5/3/26
	5	5/4/26	5/10/26
	6	5/11/26	5/17/26
	7	5/18/26	5/24/26
	8	5/25/26	5/31/26
	9	6/1/26	6/7/26
	10	6/8/26	6/14/26
	11	6/15/26	6/21/26
	12	6/22/26	6/28/26
	13	6/29/26	7/5/26
3	1	7/6/26	7/12/26
	2	7/13/26	7/19/26
	3	7/20/26	7/26/26
	4	7/27/26	8/2/26
	5	8/3/26	8/9/26
	6	8/10/26	8/16/26
	7	8/17/26	8/23/26
	8	8/24/26	8/30/26
	9	8/31/26	9/6/26
	10	9/7/26	9/13/26
	11	9/14/26	9/20/26
	12	9/21/26	9/27/26
	13	9/28/26	10/4/26
4	1	10/5/26	10/11/26
	2	10/12/26	10/18/26
	3	10/19/26	10/25/26
	4	10/26/26	11/1/26
	5	11/2/26	11/8/26
	6	11/9/26	11/15/26
	7	11/16/26	11/22/26
	8	11/23/26	11/29/26
	9	11/30/26	12/6/26
	10	12/7/26	12/13/26
	11	12/14/26	12/20/26
	12	12/21/26	12/27/26
	13	12/28/26	1/3/27

2027			
Monitoring Quarter	Week #	*Monday* Start Date	*Sunday* End Date
1	1	1/4/27	1/10/27
	2	1/11/27	1/17/27
	3	1/18/27	1/24/27
	4	1/25/27	1/31/27
	5	2/1/27	2/7/27
	6	2/8/27	2/14/27
	7	2/15/27	2/21/27
	8	2/22/27	2/28/27
	9	3/1/27	3/7/27
	10	3/8/27	3/14/27
	11	3/15/27	3/21/27
	12	3/22/27	3/28/27
	13	3/29/27	4/4/27

Appendix B As-Builts and Record Drawings

TOWN OF ANDOVER, MASSACHUSETTS

LEDGE ROAD LANDFILL CLOSURE PROJECT



LOCATION PLAN
NTS

BOARD OF SELECTMEN

ALEXANDER J. VISPOLI, CHAIR
ELLEN TOWNSON, VICE CHAIR
MELISSA DANISCH, CLERK
KEVIN COFFEY, MEMBER
LAURA M. GREGORY, MEMBER

TOWN MANAGER

ANDREW P. FLANAGAN

DIRECTOR OF PUBLIC WORKS

CARLOS JAQUEZ

RECORD DRAWING

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By _____ Date 10/30/2025
NATHAN JONES
CDM Smith

OCTOBER 2025

RECORD DRAWINGS

CDM Smith

BOSTON, MASSACHUSETTS

Water *Environment* *Transportation* *Energy* *Facilities*

0235-113811

LIST OF DRAWINGS

SHEET	TITLE
G–1	INDEX SHEET
G–2	GENERAL NOTES AND LEGEND
G–3	OVERALL SITE KEY PLAN
G–4	SITE ACCESS AND CONSTRUCTION STAGING PLAN
G–5	OVERALL EXISTING CONDITIONS PLAN
ES–1	EROSION AND SEDIMENTATION CONTROL PLAN
ES–2	EROSION AND SEDIMENTATION CONTROL DETAILS
C–1	EXISTING CONDITIONS AND REMOVAL PLAN (SHEET 1 OF 4)
C–2	EXISTING CONDITIONS AND REMOVAL PLAN (SHEET 2 OF 4)
C–3	EXISTING CONDITIONS AND REMOVAL PLAN (SHEET 3 OF 4)
C–4	EXISTING CONDITIONS AND REMOVAL PLAN (SHEET 4 OF 4)
C–5	WASTE RELOCATION KEY PLAN/ WETLAND SOILS REMEDIATION KEY PLAN
C–6	WASTE RELOCATION FOCUS PLANS
C–7	WETLAND SOILS REMEDIATION PLAN (SHEET 1 OF 3)
C–8	WETLAND SOILS REMEDIATION PLAN (SHEET 2 OF 3)
C–9	WETLAND SOILS REMEDIATION PLAN (SHEET 3 OF 3)
C–10	CAPPING PLAN (SHEET 1 OF 4)
C–11	CAPPING PLAN (SHEET 2 OF 4)
C–12	CAPPING PLAN (SHEET 3 OF 4)
C–13	CAPPING PLAN (SHEET 4 OF 4)
C–14	FINAL GRADING AND DRAINAGE PLAN (SHEET 1 OF 4)
C–15	FINAL GRADING AND DRAINAGE PLAN (SHEET 2 OF 4)
C–16	FINAL GRADING AND DRAINAGE PLAN (SHEET 3 OF 4)
C–17	FINAL GRADING AND DRAINAGE PLAN (SHEET 4 OF 4)
C–18	LAYOUT AND MATERIALS PLAN (SHEET 1 OF 4)
C–19	LAYOUT AND MATERIALS PLAN (SHEET 2 OF 4)
C–20	LAYOUT AND MATERIALS PLAN (SHEET 3 OF 4)
C–21	LAYOUT AND MATERIALS PLAN (SHEET 4 OF 4)
C–22	LANDFILL GAS MANAGEMENT SYSTEM LAYOUT KEY PLAN
C–23	LANDFILL GAS MANAGEMENT SYSTEM LAYOUT (SHEET 1 OF 3)
C–24	LANDFILL GAS MANAGEMENT SYSTEM LAYOUT (SHEET 2 OF 3)
C–25	LANDFILL GAS MANAGEMENT SYSTEM LAYOUT (SHEET 3 OF 3)
C–26	CROSS SECTIONS A–A', B–B'
C–27	CROSS SECTIONS C–C', D–D'
C–28	CROSS SECTIONS E–E', F–F', G–G'
C–29	GREENWOOD ROAD STORM DRAIN LAYOUT PLAN
D–1	CIVIL DETAILS
D–2	LANDFILL DETAILS I
D–3	LANDFILL DETAILS II
D–4	STORMWATER DETAILS I
D–5	STORMWATER DETAILS II
D–6	STORMWATER DETAILS III
D–7	ENVIRONMENTAL MONITORING AND LANDFILL GAS MANAGEMENT SYSTEM DETAILS
D–8	MISCELLANEOUS DETAILS I
D–9	WETLAND REPLICATION PLAN AND SECTION
D–10	GREENWOOD ROAD STORM DRAIN DETAILS

RECORD DRAWING

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By _____ Date 10/30/2025

NATHAN JONES

CDM Smith

REV. NO.	DATE	DRWN	CHKD	REMARKS
3	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
2	3/2023	JRH	NEJ	UPDATED FOR BIDDING
1	11/2022	KAR	NEJ	REMOVED POST–CLOSURE USE/ DPW MATERIALS HANDLING AREA

DESIGNED BY: G. HOWARD
DRAWN BY: J. HEIL
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

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TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

INDEX SHEET

PROJECT NO. 0235–113811
FILE NAME: G001INDXRD.DWG

SHEET NO.
G-1

RECORD DRAWING

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EXISTING LEGEND

- MONITORING WELL
- DRAIN MANHOLE
- CATCHBASIN
- BOLLARD
- OUTFALL
- IRRIGATION CONTROL VALVE
- ELECTRIC HANDHOLD
- ELECTRIC METER
- UTILITY POLE W/ LIGHT
- UTILITY POLE
- HYDRANT
- WATER MANHOLE
- WATER GATE VALVE
- SBDH — STONE BOUND W/ DRILL HOLE
- SBLP — STONE BOUND W/ LEAD PLUG
- DHF — DRILL HOLE FOUND
- IRF — IRON ROD FOUND
- CMP — CORRUGATED METAL PIPE
- RCP — REINFORCED CONCRETE PIPE
- ABS — ASBESTOS PIPE
- CI — CAST IRON
- INV. — INVERT
- WETLAND LINE/FLAGS
- TOP OF BANK LINE
- FENCE
- OVERHEAD WIRES
- UNDERGROUND ELECTRIC LINE
- WATER LINE
- DRAIN LINE
- GAS LINE
- PROPERTY LINE
- EASEMENT LINE
- 150 — CONTOUR INDEX
- CONTOUR INTERMEDIATE
- APPROXIMATE EDGE OF WASTE
- 50 FT NO DISTURB
- 75 FT NO BUILD
- 100 FT BUFFER
- PROJECT LIMITS
- VERNAL POOL BUFFER
- VERNAL POOL
- ISOLATED WETLAND
- T# — 2016 TRENCH
- TP-# — 2016 TEST PIT
- TP-# — 2015 TEST PIT
- TP-# — 2009 TEST PIT

SURVEY NOTES

1. EXISTING CONDITIONS PLANS PREPARED BY WSP AND DELIVERED ON AUGUST 18, 2015
2. BEARINGS AND COORDINATES SHOWN ARE BASED ON THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM (NAD 83) ESTABLISHED BY GPS OBSERVATION.
3. ELEVATIONS REFERENCE NGVD 29, BASED ON BENCHMARK: MASSACHUSETTS DPW BRASS DISK NO. 5140Z, ELEVATION = 171.799 (NGVD 29) (US SURVEY FEET) ON CHANDLER ROAD BRIDGE OVER NORTHBOUND LANE OF RT. 495.
4. TOWN OF ANDOVER REPORTEDLY DISCONNECTED LEDGE ROAD STORM DRAINAGE PIPE FROM GREENWOOD ROAD DRAINAGE SYSTEM IN AUGUST 2011.
5. LEGAL BOUNDARY SURVEY BY WSP GROUP TRANSPORTATION INFRASTRUCTURE; 155 MAIN DUNSTABLE RD. SUITES 120 &125; NASHUA, NH 03060; 9/15/15.
6. EXISTING TOPOGRAPHY UPDATED BY WSP NOVEMBER 2018.
7. AS BUILT CONDITIONS FROM SURVEY BY J. BATES AND SON DELIVERED SEPTEMBER 2025

WETLAND SURVEY NOTES:

1. FIELD DELINEATION PERFORMED ON JUNE 4, 5, 8, 12, 17, AND JULY 23, 2015*. ADDITIONAL FIELD DELINEATION PERFORMED ON JUNE 6, 2016** BY: ANDREW POYANT, PWS; MAGDALENA LOFSTEDT, PWS; AND CONOR VEENEMAN.
2. SITE SURVEY:
   WETLAND FLAG LOCATIONS: LEDGE ROAD LANDFILL; ANDOVER, MA.
   SITE SURVEY BY: WSP GROUP TRANSPORTATION & INFRASTRUCTURE; 155 MAIN DUNSTABLE RD. SUITES 120& 125; NASHUA, NH 03060; 8/18/15.
   ADDITIONAL WETLAND FLAG SURVEY PERFORMED ON 11/10, 11/2015* AND 8/11/2016**. FLAGS LEC CC-1 THROUGH CC-6 FIELD LOCATED BY CDM SMITH USING HANDHELD GPS ON 1/7/2017. FLAGS BB-6A THROUGH BB-6G FIELD LOCATED BY CDM SMITH USING HANDHELD GPS ON 2/21/2017.
3. THE ENTIRETY OF THE LEDGE ROAD LANDFILL PROPERTY IS LOCATED WITHIN THE ANDOVER WATERSHED PROTECTION OVERLAY DISTRICT WPOD.

* WETLAND DELINEATION APPROVED BY THE TOWN OF ANDOVER CONSERVATION COMMISSION, ORAD 12/7/2015, STAMPED PLAN 12/4/2015.

** NOT INCLUDED IN THE ORAD APPROVED BY THE TOWN OF ANDOVER CONSERVATION COMMISSION:
1-78 THROUGH 1-86
AA-1 THROUGH AA-8
BB-1 THROUGH BB-8
CC-1 THROUGH CC-12
DD-1 THROUGH DD-18
TOB CC-1 THROUGH TOB CC-12
TOB DD-19 AND TOB DD-20

CONSTRUCTION NOTES:

1. CONTACT DIGSAFE AT 888-DIG-SAFE OR 811 A MINIMUM OF 72 HOURS PRIOR TO CONSTRUCTION.
2. CLEAR VEGETATION ONLY AS REQUIRED TO COMPLETE WORK. MINIMIZE TREE CUTTING AND REMOVAL. ALL TREES TO BE CLEARED SHALL BE IDENTIFIED FOR REVIEW BY ENGINEER PRIOR TO CLEARING. REMOVE TREES AND VEGETATION NECESSARY TO COMPLETE THE WORK AS SHOWN. LIMIT OF CLEARING TO BE REVIEWED IN FIELD WITH ENGINEER PRIOR TO EXECUTION.
3. GRADE SUBGRADE FOR LLDPE CAP TO MAXIMUM SLOPE OF 3 HORIZONTAL TO 1 VERTICAL AND MINIMUM SLOPE OF 5%.
4. ALL DISTURBED AREAS OUTSIDE CAP AND/OR GRAVEL ACCESS ROAD LIMITS NOT COVERED BY RIPRAP SHALL RECEIVE MIN. 6" LAYER LOAM AND SEED.
5. RETAIN A MASSACHUSETTS LICENSED LAND SURVEYOR TO CONFIRM AND STAKE ALL PROPERTY LINES BETWEEN TOWN OWNED PROPERTY AND PRIVATE PROPERTY, UTILITY EASEMENT, AND CONSTRUCTION EASEMENTS PRIOR TO START OF CONSTRUCTION ACTIVITIES.
6. ALL AREAS OUTSIDE THE LIMIT OF DISTURBANCE SHALL BE PROTECTED AT ALL TIMES UNLESS OTHERWISE DIRECTED BY THE ENGINEER. ALL AREAS DISTURBED OUTSIDE THE LIMIT OF WORK SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE IN A MANNER APPROVED BY THE ENGINEER AND ANY AFFECTED PARTY.
7. EXISTING EDGE OF WASTE INDICATED ON THE DRAWINGS IS APPROXIMATE AND MUST BE CONFIRMED IN THE FIELD BY THE CONTRACTOR DURING CONSTRUCTION.
8. PRESERVE AND PROTECT ALL EXISTING GROUNDWATER MONITORING WELLS NOT IDENTIFIED TO BE DECOMMISSIONED OR REMOVED. ANY DAMAGE CAUSED BY THE CONTRACTOR SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE.

EROSION CONTROL NOTES:

1. ALL WORK SHALL CONFORM TO MASSDEP GUIDELINES FOR EROSION AND SEDIMENTATION CONTROL LATEST VERSION.
2. EROSION CONTROLS SHOWN ON PLANS ARE THE MINIMUM REQUIRED. CONTRACTOR MAY BE REQUIRED TO ADJUST LOCATIONS AND ELEVATIONS OF SEDIMENTATION BARRIERS OR ADD ADDITIONAL EROSION CONTROL MEASURES AS REQUIRED BY ENGINEER.
3. PRIOR TO UNDERTAKING ANY WORK AT THE SITE, PREPARE AN EROSION CONTROL PLAN IN ACCORDANCE WITH NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PHASE II FOR APPROVAL BY THE ENGINEER TO PROTECT THE SITE FROM EROSION AND PREVENT THE MOVEMENT OF SEDIMENT AND DEBRIS INTO DRAINAGE SYSTEMS AND WETLAND AREAS.
4. PREPARE A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) FOR APPROVAL BY THE ENGINEER TO PROTECT THE SITE FROM EROSION AND PREVENT THE MOVEMENT OF SEDIMENT AND DEBRIS INTO DRAINAGE SYSTEMS, WETLAND AREAS, AND OFF-SITE AREAS PRIOR TO BEGINNING CONSTRUCTION ACTIVITIES. MAINTAIN A COPY OF THE SWPPP ON SITE AT ALL TIMES.
5. DEMARCATE EXISTING WETLAND BOUNDARIES, IF FLAGGING IS MISSING, PRIOR TO START OF CONSTRUCTION.
6. NPDES PERMIT AND MASSDEP FILE NUMBERS SHALL BE POSTED IN A POSITION TO BE PUBLICLY VISIBLE AT ALL TIMES.
7. INSTALL COMPOST SOCKS AT THE LIMITS OF WORK ON THE DOWNGRADIENT SIDE OF THE WORK AREA AS SHOWN ON THE PROJECT PLANS PRIOR TO COMMENCEMENT OF WORK TO PREVENT EROSION OR SEDIMENTATION INTO RESOURCE AREAS. WORK FROM ADJACENT UPLANDS.
8. INSPECT SEDIMENT BARRIERS WEEKLY AND AFTER ALL STORM EVENTS OF ½-INCH OR GREATER. REPAIR AS NEEDED AND AS DIRECTED BY THE ENGINEER OR OWNER WITHIN 48 HOURS OF ANY STORM EVENT.
9. MAINTAIN THE SEDIMENTATION AND EROSION CONTROL SYSTEMS FOR THE DURATION OF THE CONTRACT. MAINTENANCE SHALL INCLUDE CLEANING AND/OR REPLACING SYSTEMS THAT ARE NO LONGER FUNCTIONAL DUE TO SEDIMENT BUILD-UP AND DEGRADATION AS DETERMINED BY THE ENGINEER. BARRIERS SHALL BE LEFT IN PLACE UNTIL THE AREA IS PERMANENTLY STABILIZED.
10. INSTALL EROSION CONTROL BLANKET ON ALL LOAM AND SEEDED SLOPES OF 4:1 (HORIZONTAL:VERTICAL) OR STEEPER TO MINIMIZE SOIL EROSION.
11. CONSTRUCT NEW AND/OR TEMPORARY BASINS PRIOR TO COMMENCING OTHER WORK. DIRECT RUNOFF INTO TEMPORARY OR PERMANENT DETENTION/SEDIMENTATION BASINS, WHERE PRACTICAL, VIA SWALES OR BERMS. SEED AND COVER SWALES AND BERMS WITH EROSION CONTROL BLANKETS TO ALLOW GRASS ROOTS TO DEVELOP SUFFICIENTLY TO STABILIZE THE SOIL.
12. PROVIDE EROSION PROTECTION FOR DRAIN INLETS AND STRUCTURES UPON INSTALLATION AND LEAVE IN PLACE UNTIL ADJACENT SURFACES ARE STABILIZED.
13. WHERE CONSTRUCTION OCCURS WITHIN THE 100-FOOT BUFFER ZONE, SEED AND MULCH DISTURBED AREAS TO STABILIZE SOILS AND PREVENT EROSION AS SOON AS POSSIBLE AFTER CONSTRUCTION IS COMPLETE, AND WHEN NO FURTHER ALTERATION IS ANTICIPATED FOR 30 OR MORE DAYS. IN THE EVENT THAT THIS WORK IS TO TAKE PLACE OUTSIDE OF THE GROWING SEASON, PLACE SOIL COVERS OR MULCH OVER THESE AREAS TO MINIMIZE EROSION.
14. INSTALL TEMPORARY HAY BALE CHECK DAMS IN SWALES TO REDUCE FLOW VELOCITIES AND MINIMIZE EROSION. (SEE DETAIL 7 ON SHEET ES-2)
15. WORK SHALL PROCEED AS RAPIDLY AS POSSIBLE TO LIMIT THE EXPOSURE TIME OF DISTURBED SOILS TO WIND AND PRECIPITATION.
16. PROVIDE STREET SWEEPING AS REQUIRED TO MINIMIZE TRACKING OF SOILS ONTO PUBLIC STREETS.
17. APPLY WATER AS NECESSARY TO MINIMIZE DUST.
18. UPON COMPLETION OF CONSTRUCTION ACTIVITIES INSPECT AND CLEAN OUT NEW DRAINAGE SYSTEM COMPONENTS TO THE SATISFACTION OF THE ENGINEER AND OWNER.
19. REMOVE AND SATISFACTORILY DISPOSE ALL SEDIMENT CONTROL STRUCTURES UPON COMPLETION OF ALL WORK AND SOIL STABILIZATION AS DIRECTED BY THE ENGINEER AND OWNER.
20. CONTRACTOR SHALL INSTALL AND MAINTAIN CATCH BASIN FILTERS IN ALL PROPOSED CATCH BASINS, AS SHOWN ON SHEETS C-14 THROUGH C-17, UNTIL ALL CONSTRUCTION ACTIVITIES ARE COMPLETED.

STORAGE AND STOCKPILE NOTES

1. ALL EQUIPMENT STORAGE, REFUELING AND ANY REQUIRED MINOR MAINTENANCE SHALL OCCUR OUTSIDE OF THE 100-FOOT BUFFER ZONE TO WETLANDS. LIMIT OF AREA SHALL BE DEFINED BY A TEMPORARY CONSTRUCTION FENCE.
2. MAINTAIN A SUPPLY OF ALL PURPOSE OIL ABSORBENT MATERIAL WITH THE EQUIPMENT AND IN THE REFUELING AREA FOR THE CLEAN-UP OF ANY ACCIDENTAL SPILLS DURING REFUELING OR MAINTENANCE OPERATIONS.NOTIFY THE PROPER AUTHORITIES IN THE EVENT OF AN ACCIDENTAL RELEASE.
3. INSPECT ALL HYDRAULIC LINES ON ALL CONSTRUCTION EQUIPMENT AND VEHICLES AT THE BEGINNING AND END OF EACH WORKDAY.
4. STORE ALL OIL, HYDRAULIC FLUID, OR OTHER HAZARDOUS MATERIAL IN ORIGINAL CONTAINERS. FUEL SHALL BE STORED IN CLEARLY MARKED, TIGHTLY SEALED CONTAINERS. ALL SUCH MATERIAL SHALL BE STORED UNDER A ROOF OR IN A COVERED ENCLOSURE.
5. ALL TRUCKS, STORAGE BINS, AND CONTAINERS ENTERING OR LEAVING THE SITE SHALL BE COVERED.

RECORD DRAWING

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By _____ Date 10/30/2025
NATHAN JONES
CDM Smith

REV. NO.	DATE	DRWN	CHKD	REMARKS
4	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
3	3/2023	JRH	NEJ	UPDATED FOR BIDDING
2	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE/ DPW MATERIALS HANDLING AREA
1	4/2017	JRH	NEJ	REVISED TO RESPOND TO COMMENTS FROM THE U.S. ARMY CORPS. OF ENGINEERS

DESIGNED BY: G. HOWARD
DRAWN BY: J. HEIL
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

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TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

GENERAL NOTES AND LEGEND

PROJECT NO. 0235-113811
FILE NAME: G002GNLGRD.DWG
SHEET NO. G-2

RECORD DRAWING

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SHEET 4 OF 4

SHEET 1 OF 4

SHEET 3 OF 4

SHEET 2 OF 4

SHEET MATCH LINE
SHEET MATCH LINE

VERNAL POOL #1
VERNAL POOL #2
VERNAL POOL #3
VERNAL POOL #4
VERNAL POOL #5

150 FOOT WIDE UTILITY EASEMENT (BOOK 538, PAGE 104)

PROJECT LIMITS
PROPERTY LINE
EDGE OF CAP
50 FT NO DISTURB
75 FT NO BUILD
100 FT BUFFER
GRAVEL ACCESS DRIVE TO BASIN
GRAVEL ACCESS DRIVE
CHANDLER ROAD
GREENWOOD ROAD
PETTINGELL AVENUE
50 FOOT WIDE DRAIN EASEMENT (BOOK 1181, PAGE 958)

BENCHMARK TBM-A
RAIL-ROAD SPIKE SET IN BASE OF 18" OAK TREE
ELEVATION = 154.36'

BENCHMARK TBM-B
RAIL-ROAD SPIKE SET IN BASE OF 14" OAK TREE
ELEVATION = 162.54'

BENCHMARK TBM-C
LARGE MAG NAIL SET IN BASE OF 24" OAK TREE
ELEVATION = 175.51'

BENCHMARK TBM-D
RAIL ROAD SPIKE SET IN BASE OF UTILITY POLE #4780
ELEVATION = 172.55'

ATHLETIC FIELD

PROPOSED LEGEND

- DECIDUOUS TREE
- EVERGREEN TREE
- RIPRAP
- ARTICULATED CONCRETE BLOCK
- WETLAND REPLICATION AREA
- 196.6 + FINAL SPOT ELEVATION
- 188 FINAL CONTOUR
- POTENTIAL FUTURE WALKING PATH
- PROJECT LIMITS
- EDGE OF LANDFILL CAP
- LIMIT OF AREA RESERVED FOR FUTURE SOLAR ARRAY
- REVISED TREELINE

NOTE: FOR EXISTING CONDITIONS NOTES AND LEGEND, SEE SHEET G-2.

RECORD DRAWING

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By _____ Date 10/30/2025
NATHAN JONES
CDM Smith

1" = 80'
40 0 80

REV. NO.	DATE	DRWN	CHKD	REMARKS
4	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
3	3/2023	JRH	NEJ	UPDATED FOR BIDDING
2	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE/ DPW MATERIALS HANDLING AREA
1	4/2017	JRH	NEJ	REVISED TO RESPOND TO CONSERVATON COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY: G. HOWARD
DRAWN BY: J. HEIL
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

CDM Smith
75 State Street, Suite 701
Boston, MA 02109
Tel. (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

OVERALL SITE KEY PLAN

PROJECT NO. 0235-113811
FILE NAME: G003KYPLRD.DWG
SHEET NO. G-3

RECORD DRAWING

XREFs: [Wetland Survey Dwg - WSP 9.2.15, Final_Grading-Working, Full Site Survey Revised 5.11.16, C001GRPL, C007-SRP_OLDFILE, 16365-CS-BN, CDMS_2436, 20250915 ANDOVER, SHEET 4.FINAL GRADING] Images: []
Last saved by: YOUNGCK Time: 10/30/2025 9:16:37 AM
pw:\\cdmsmith-az02-pw.bentley.com:pw_p11\0235\11381\04 Design Services NM_100%\02 Civil\10 CADD\2025 RECORD DRAWINGS\G004ASPLRD.dwg
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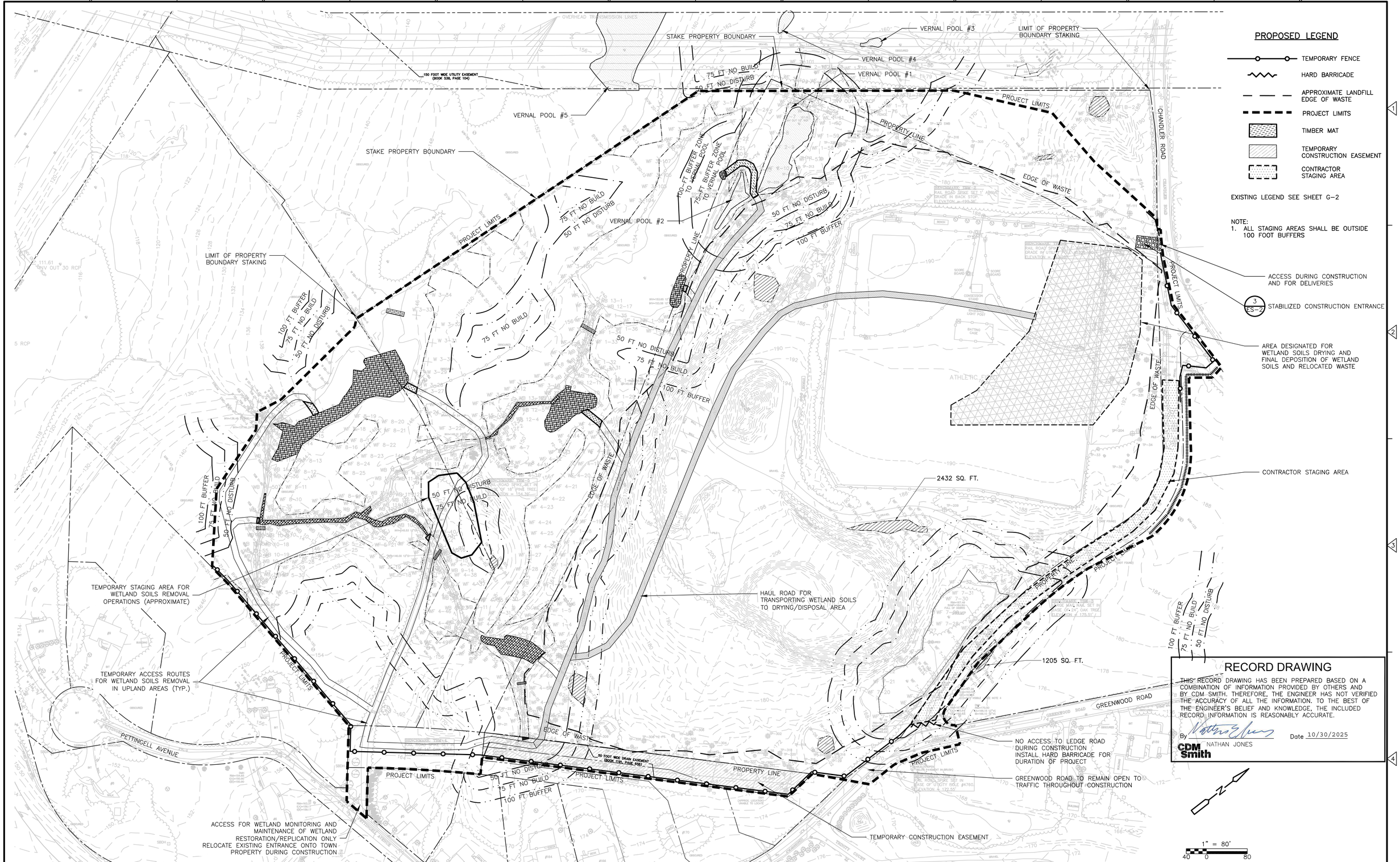
2025827 andover sheet 3.liner, 20250827 andover sheet 1. CULVERT, 20250827 andover. sheet 2.subgrade,


VERNAL POOL #3
VERNAL POOL #4
VERNAL POOL #1
VERNAL POOL #5
VERNAL POOL #2
STAKE PROPERTY BOUNDARY
LIMIT OF PROPERTY BOUNDARY STAKING
150 FOOT WIDE UTILITY EASEMENT (BOOK 538, PAGE 104)
OVERHEAD TRANSMISSION LINES
PROJECT LIMITS
PROPERTY LINE
EDGE OF WASTE
CHANDLER ROAD
75 FT NO BUILD
50 FT NO DISTURB
100 FT BUFFER
100-FT BUFFER ZONE TO VERNAL POOL
75-FT BUFFER ZONE TO VERNAL POOL
ACCESS DURING CONSTRUCTION AND FOR DELIVERIES
3 ES-2 STABILIZED CONSTRUCTION ENTRANCE
AREA DESIGNATED FOR WETLAND SOILS DRYING AND FINAL DEPOSITION OF WETLAND SOILS AND RELOCATED WASTE
CONTRACTOR STAGING AREA
2432 SQ. FT.
1205 SQ. FT.
HAUL ROAD FOR TRANSPORTING WETLAND SOILS TO DRYING/DISPOSAL AREA
TEMPORARY STAGING AREA FOR WETLAND SOILS REMOVAL OPERATIONS (APPROXIMATE)
TEMPORARY ACCESS ROUTES FOR WETLAND SOILS REMOVAL IN UPLAND AREAS (TYP.)
ACCESS FOR WETLAND MONITORING AND MAINTENANCE OF WETLAND RESTORATION/REPLICATION ONLY
RELOCATE EXISTING ENTRANCE ONTO TOWN PROPERTY DURING CONSTRUCTION
PETTINGELL AVENUE
GREENWOOD ROAD
NO ACCESS TO LEDGE ROAD DURING CONSTRUCTION INSTALL HARD BARRICADE FOR DURATION OF PROJECT
GREENWOOD ROAD TO REMAIN OPEN TO TRAFFIC THROUGHOUT CONSTRUCTION
TEMPORARY CONSTRUCTION EASEMENT
50 FOOT WIDE DRAIN EASEMENT (BOOK 1181, PAGE 958)
ATHLETIC FIELD
1" = 80'
40 0 80

PROPOSED LEGEND

- TEMPORARY FENCE
- HARD BARRICADE
- APPROXIMATE LANDFILL EDGE OF WASTE
- PROJECT LIMITS
- TIMBER MAT
- TEMPORARY CONSTRUCTION EASEMENT
- CONTRACTOR STAGING AREA

EXISTING LEGEND SEE SHEET G-2

NOTE:
1. ALL STAGING AREAS SHALL BE OUTSIDE 100 FOOT BUFFERS

RECORD DRAWING

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By Nathan E. Jones Date 10/30/2025

NATHAN JONES
CDM Smith

REV. NO.	DATE	DRWN	CHKD	REMARKS
3	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
2	3/2023	JRH	NEJ	UPDATED FOR BIDDING
1	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE/ DPW MATERIALS HANDLING AREA

DESIGNED BY: G. HOWARD
DRAWN BY: J. HEIL
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

CDM Smith
75 State Street, Suite 701
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Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

SITE ACCESS AND CONSTRUCTION STAGING PLAN

PROJECT NO. 0235-113811
FILE NAME: G004ASPLRD.DWG

SHEET NO.
G-4

RECORD DRAWING

XREFs: [Wetland Survey Dwg – WSP 9.2.15, Final_Grading-Working, Full Site Survey Revised 5.11.16, C001GRPL, 16365-CS-BN, CDMS_2436, 20250328 andover sheet 2.subgrade, 20250328 ANDOVER, SHEET 4.FINAL GRADING] Images: [Stamp 2022.11.01] Last saved by: YOUNGDK Time: 10/7/2025 4:39:38 PM pw:\\cdmsmith-az02-pw.bentley.com:pw_p11\0235\\113811\04 Design Services NM_100%\02 Civil\10 CADD\2025 RECORD DRAWINGS\G005EXPLRD.dwg
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RECORD DRAWING

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By _____ Date 10/30/2025
NATHAN JONES
CDM Smith

VERNAL POOL #1
VERNAL POOL #2
VERNAL POOL #3
VERNAL POOL #4
VERNAL POOL #5
100 FT BUFFER ZONE VERNAL POOL
75 FT NO BUILD
50 FT NO DISTURB
100 FT BUFFER
PROJECT LIMITS
PROPERTY LINE
EDGE OF WASTE
LEDGE ROAD
CHANDLER ROAD
GREENWOOD ROAD
BENNETT STREET
BENNETT ROAD
BENCHMARK: TBM-2 RAIL ROAD SPIKE SET 1" ABOVE GRADE IN BACK STOP. ELEVATION = 190.56'
BENCHMARK: TBM-1 RAIL ROAD SPIKE SET 1" ABOVE GRADE IN UTILITY POLE #5226-90. ELEVATION = 193.28'
BENCHMARK: TBM-3 LARGE MAG NAIL SET IN BASE OF 24" OAK TREE. ELEVATION = 175.51'
BENCHMARK: TBM-4 RAIL ROAD SPIKE SET IN BASE OF 14" OAK TREE. ELEVATION = 162.54
BENCHMARK: TBM-5 RAIL ROAD SPIKE SET IN BASE OF 18" PINE TREE. ELEVATION = 154.32'
BENCHMARK: TBM-6 RAIL ROAD SPIKE SET IN BASE OF UTILITY POLE #4760. ELEVATION = 172.56'
DOWNGRADIENT AREA OF ARSENIC IMPACTED WETLAND SOILS*
RECLAIM TO BE USED ABOVE CAP (APPROXIMATE LOCATIONS)
DPW / MATERIALS HANDLING AREA
LANDFILL
WETLAND LINE (NOT SHOWN) AND ASSOCIATED BUFFERS BASED ON GPS OF WETLAND FLAGS RECORDED ON MAY 26, 2016 ON WEST FIRE STATION PROPERTY
NOTE: FOR EXISTING CONDITIONS NOTES AND LEGEND, SEE SHEET G-2
1" = 80'

REV. NO.	DATE	DRWN	CHKD	REMARKS
3	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
2	3/2023	JRH	NEJ	UPDATED FOR BIDDING
1	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE / DPW MATERIALS HANDLING AREA

DESIGNED BY: G. HOWARD
DRAWN BY: J. HEIL
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

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TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

OVERALL EXISTING CONDITIONS PLAN

PROJECT NO. 0235-113811
FILE NAME: G005EXPLRD.DWG
SHEET NO. G-5

RECORD DRAWING

XREFs: [Wetland Survey Dwg – WSP 9.2.15, Final_Grading-Working, Full Site Survey Revised 5.11.16, C001GRPL, C007-SRP_OLDFILE, 16305-CS-BN, CDMS_2436, 20250915 ANDOVER, SHEET 4_FINAL GRADING] Images: [] Last saved by: YOUNGGK Time: 10/30/2025 9:20:49 AM pw:\\cdmsmith-az02-pw.bentley.com:pw_p11\0235\113811\04 Design Services NAL_1005%02 Civil\10 CADD\2025 RECORD DRAWINGS\ES01ESPLRD.dwg
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By NATHAN JONES Date 10/30/2025

CDM Smith

VERNAL POOL #5
VERNAL POOL #4
VERNAL POOL #3
VERNAL POOL #1
VERNAL POOL #2
150 FOOT WIDE UTILITY EASEMENT (BOOK 538, PAGE 104)
OVERHEAD TRANSMISSION LINES
200 FT BUFFER ZONE TO VERNAL POOL
75 FT BUFFER ZONE TO VERNAL POOL
75 FT NO BUILD
50 FT NO DISTURB
100 FT BUFFER
EDGE OF WASTE
PROPERTY LINE
TIMBER MAT (5 ES-2)
COMPOST SOCK (APPROX. 1,135 LF) (1 ES-2)
COMPOST SOCK (APPROX. 1,412 LF) (1 ES-2)
COMPOST SOCK (APPROX. 907 LF) (1 ES-2)
COMPOST SOCK (APPROX. 74 LF) (1 ES-2)
COMPOST SOCK (APPROX. 1,745 LF) (1 ES-2)
COMPOST SOCK (APPROX. 2,015 LF) (1 ES-2)
COMPOST SOCK (APPROX. 405 LF) (1 ES-2)
COMPOST SOCK (APPROX. 200 LF) (1 ES-2)
STABILIZED CONSTRUCTION ENTRANCE (3 ES-2)
STABILIZED CONSTRUCTION ENTRANCE – CONTRACTOR ACCESS ONLY DURING CONSTRUCTION (NO DELIVERIES) (3 ES-2)
2432 SQ. FT.
1205 SQ. FT.
50 FOOT WIDE DRAIN EASEMENT (BOOK 1151, PAGE 458)
111.61 INV OUT 30 RCP
5 RCP

LEGEND
- TEMPORARY COFFER DAM, SEE SHEET C-7
- COMPOST SOCK (1 ES-2)
- LIMITS OF TIMBER MAT (5 ES-2)
- APPROXIMATE LIMITS OF TEMPORARY ACCESS HAUL ROUTE

NOTES:
1. CONTRACTOR SHALL INSTALL AND MAINTAIN CATCH BASIN FILTERS IN ALL PROPOSED CATCH BASINS, AS SHOWN ON SHEETS C-14 THRU C-17, UNTIL ALL CONSTRUCTION ACTIVITIES ARE COMPLETED. (4 ES-2)
2. FOR EXISTING CONDITIONS NOTES AND LEGEND, SEE SHEET G-2.

1" = 80'
40 0 80

REV. NO.	DATE	DRWN	CHKD	REMARKS
4	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
3	3/2023	JRH	NEJ	UPDATED FOR BIDDING
2	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE / DPW MATERIALS HANDLING AREA
1	4/2017	JRH	NEJ	REVISED TO RESPOND TO COMMENTS FROM THE U.S. ARMY CORPS. OF ENGINEERS

DESIGNED BY: N. JONES
DRAWN BY: J. HEIL
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

CDM Smith
75 State Street, Suite 701
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TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

EROSION AND SEDIMENTATION CONTROL PLAN

PROJECT NO. 0235-113811
FILE NAME: ES01ESPL.DWG
SHEET NO. ES-1

RECORD DRAWING

RECORD DRAWING

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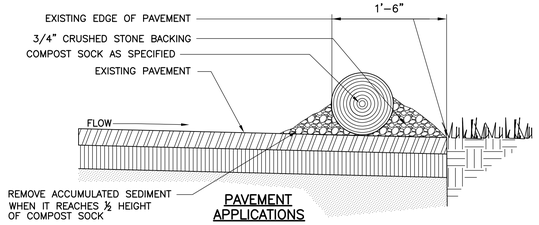
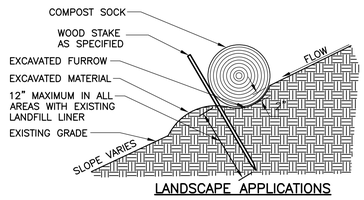
By Nathan E. Jones Date 10/30/2025

NATHAN JONES

CDM Smith



PAVEMENT APPLICATIONS

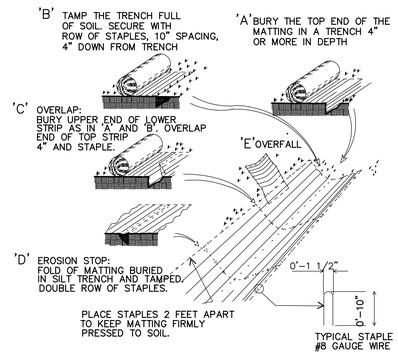


LANDSCAPE APPLICATIONS

COMPOST SOCK

DETAIL 1 — ES-2

SCALE: NTS

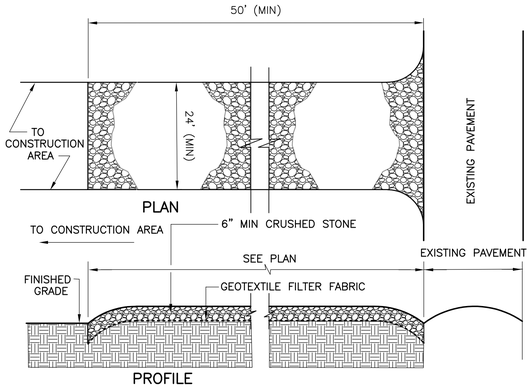

'B' TAMP THE TRENCH FULL OF SOIL. SECURE WITH ROW OF STAPLES, 10" SPACING, 4" DOWN FROM TRENCH
'A' BURY THE TOP END OF THE MATTING IN A TRENCH 4" OR MORE IN DEPTH
'C' OVERLAP: BURY UPPER END OF LOWER STRIP AS IN 'A' AND 'B'. OVERLAP END OF TOP STRIP 4" AND STAPLE.
'E' OVERFALL
'D' EROSION STOP: FOLD OF MATTING BURIED IN SILT TRENCH AND TAMPED. DOUBLE ROW OF STAPLES.
PLACE STAPLES 2 FEET APART TO KEEP MATTING FIRMLY PRESSED TO SOIL.
0'-1 1/2"
0'-10"
TYPICAL STAPLE #8 GAUGE WIRE

EROSION CONTROL BLANKET

DETAIL 2 — ES-2

NOT TO SCALE

NOTE:
1.) APPLY ON ALL NEW LOAM AND SEEDED SLOPES STEEPER THAN 4(H):1(V).



NOTES:

1.) PROVIDE APPROPRIATE TRANSITION BETWEEN STABILIZED CONSTRUCTION ENTRANCE AND EXISTING PAVEMENT.

2.) LIMITS OF STABILIZED CONSTRUCTION ENTRANCE SHALL BE AS DIRECTED BY THE ENGINEER.

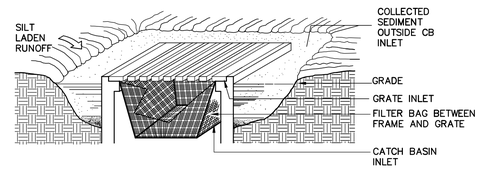
3.) THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO EXISTING PAVEMENT. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR ADDING STONE TO THE LENGTH OF THE ENTRANCE.

4.) REPAIR AND CLEANOUT MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO EXISTING PAVEMENT SHALL BE REMOVED AS DIRECTED BY THE ENGINEER.

STABILIZED CONSTRUCTION ENTRANCE

DETAIL 3 — ES-2

NOT TO SCALE



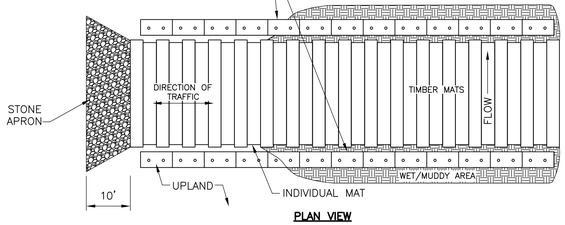
CATCH BASIN FILTER

DETAIL 4 — ES-2

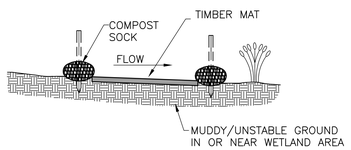
NOT TO SCALE

COMPOST SOCK SHALL BE PLACED ALONG EDGE OF TIMBER MATS TO PROTECT WETLANDS FROM SEDIMENTATION CAUSED BY VEHICLE TRAFFIC (1 / ES-2)

TYPICAL MAT USE



PLAN VIEW



ELEVATION VIEW

NOTES:

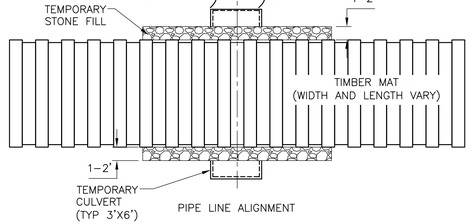
1. PLACE TIMBER MATS SO PLANKS ARE PERPENDICULAR TO DIRECTION OF TRAFFIC.
2. REMOVE SEDIMENT DEPOSITS ALONG EDGES OF MATS ON A REGULAR BASIS.
3. LENGTH OF MAT VARIES. SEE SHEETS C-7 THROUGH C-9 FOR LENGTHS.
4. WIDTH VARIES BY MULTIPLES OF 4-FT. TYPICAL WIDTH IS 12-FT.
5. SOURCE: USACE – NEW ENGLAND DISTRICT, NE GP PERMIT RESOURCES, CONSTRUCTION MAT BMP'S – 6/10/13 DRAFT.

TIMBER MAT

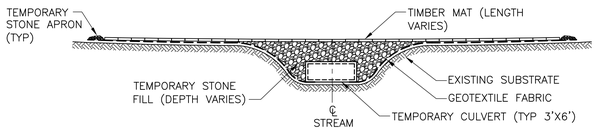
DETAIL 5 — ES-2

NOT TO SCALE

USE AT STREAMS



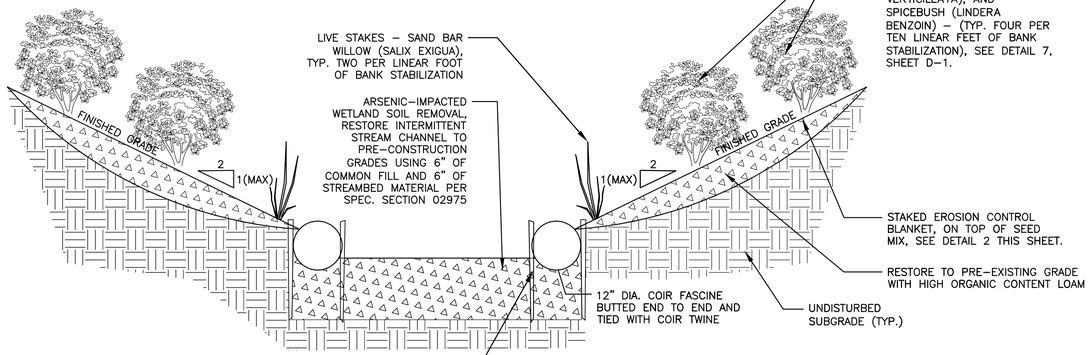
PLAN VIEW



CROSS-SECTION

NOTES:

1. WIDTH OF TEMPORARY STONE FILL SHALL NOT EXCEED 35-FT.


FINISHED GRADE
2
1(MAX)
LIVE STAKES – SAND BAR WILLOW (SALIX EXIGUA), TYP. TWO PER LINEAR FOOT OF BANK STABILIZATION
ARSENIC-IMPACTED WETLAND SOIL REMOVAL, RESTORE INTERMITTENT STREAM CHANNEL TO PRE-CONSTRUCTION GRADES USING 6" OF COMMON FILL AND 6" OF STREAMBED MATERIAL PER SPEC. SECTION 02975
SHRUB PLANTING – NORTHERN ARROWWOOD (VIBURNUM RECOGNITUM), WINTERBERRY (ILEX VERTICILLATA), AND SPICEBUSH (LINDERA BENZOIN) – (TYP. FOUR PER TEN LINEAR FEET OF BANK STABILIZATION), SEE DETAIL 7, SHEET D-1.
STAKED EROSION CONTROL BLANKET, ON TOP OF SEED MIX, SEE DETAIL 2 THIS SHEET.
RESTORE TO PRE-EXISTING GRADE WITH HIGH ORGANIC CONTENT LOAM
12" DIA. COIR FASCINE BUTTED END TO END AND TIED WITH COIR TWINE
UNDISTURBED SUBGRADE (TYP.)
(2) 4' LONG HARDWOOD STAKES APPROX. 4'-0" O.C. – INSTALL PER MANUFACTURERS INSTRUCTIONS

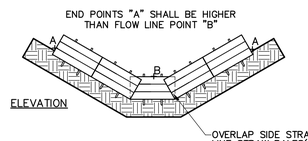
NOTE:
1. TUBELINGS SHALL BE FURNISHED IN NURSERY GROWN CONTAINERS-GROWN FOR A MINIMUM OF ONE SEASON AND HARDENED OFF AND SHALL BE AS MANUFACTURED BY NEW ENGLAND WETLAND PLANTS AMHERST, MA (TEL NO 413-548-8000) OR EQUAL.

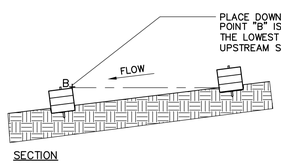
2. TUBELINGS SHALL BE INSTALLED IN A STRAIGHT LINE BEHIND FASCINE. PLANT TUBELINGS BY DRIVING A 1.75-IN DIAMETER HOLE INTO SOIL. WHEN TUBELINGS ARE REMOVED FROM CONTAINERS ENSURE THAT ROOTS REMAIN ENCASED IN POTTING SOIL. FIT TUBELINGS INTO DRIVEN HOLES AND FIRM UP SOIL AROUND PLANTED TUBELING. IMMEDIATELY AFTER PLANTING SOAK PLANTED AREAS AND CONTINUE TO KEEP MOIST FOR A MINIMUM OF TWO WEEKS.

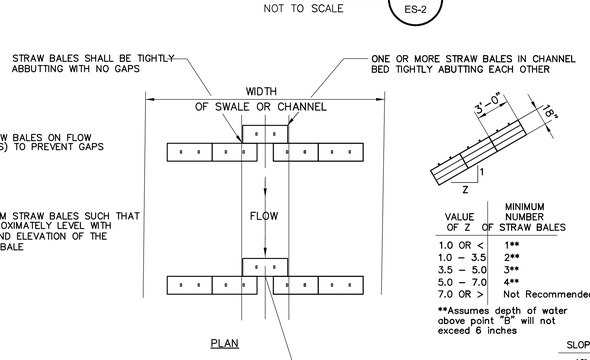
BANK STABILIZATION WITH COIR FASCINE, TUBELINGS AND SHRUB PLANTINGS

DETAIL 6 — ES-2

NOT TO SCALE


END POINTS "A" SHALL BE HIGHER THAN FLOW LINE POINT "B"
A
B
ELEVATION
OVERLAP SIDE STRAW BALES ON FLOW LINE STRAW BALES(S) TO PREVENT GAPS


PLACE DOWNSTREAM STRAW BALES SUCH THAT POINT "B" IS APPROXIMATELY LEVEL WITH THE LOWEST GROUND ELEVATION OF THE UPSTREAM STRAW BALE
FLOW
B
SECTION


STRAW BALES SHALL BE TIGHTLY ABBUTTING WITH NO GAPS
ONE OR MORE STRAW BALES IN CHANNEL BED TIGHTLY ABUTTING EACH OTHER
WIDTH OF SWALE OR CHANNEL
FLOW
PLAN
3'-0"
18"
Z
1
PLACE DOWNSTREAM STRAW BALES SUCH THAT POINT "B" IS APPROXIMATELY LEVEL WITH THE LOWEST GROUND ELEVATION OF THE UPSTREAM STRAW BALE

VALUE OF Z	MINIMUM NUMBER OF STRAW BALES
1.0 OR <	1**
1.0 – 3.5	2**
3.5 – 5.0	3**
5.0 – 7.0	4**
7.0 OR >	Not Recommended

**Assumes depth of water above point "B" will not exceed 6 inches

SLOPE	SPACING
1%	80-FT
2%	40-FT
3%	30-FT
4%	20-FT
5%	15-FT

TEMPORARY STRAW BALE CHECK DAM

DETAIL 7 — ES-2

NOT TO SCALE

REV. NO.	DATE	DRWN	CHKD	REMARKS
5	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
4	3/2023	JRH	NEJ	UPDATED FOR BIDDING
3	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE / DPW MATERIALS HANDLING AREA
2	4/2017	JRH	NEJ	REVISED TO RESPOND TO COMMENTS FROM THE U.S. ARMY CORPS. OF ENGINEERS
1	3/2017	NEJ	MHL	REVISED TO RESPOND TO CONSERVATION COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY: N. JONES
DRAWN BY: J. HEIL
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

CDM Smith
75 State Street, Suite 701
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TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

EROSION AND SEDIMENTATION CONTROL DETAILS

PROJECT NO. 0235-113811
FILE NAME: ES02ESDT.DWG

SHEET NO.
ES-2

RECORD DRAWING

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APPROXIMATE LIMIT OF VERNAL POOL #4

APPROXIMATE LIMIT OF VERNAL POOL #3

PLUG BURIED UNDERDRAIN (2 / D-10)

VERNAL POOL #1

VERNAL POOL #2

NON-JURISDICTIONAL STATE/LOCAL ISOLATED WETLANDS

MATCH LINE C-4

MATCH LINE – C-2

DECOMMISSION MONITORING WELL

DECOMMISSION MONITORING WELLS

100-FT BUFFER ZONE TO VERNAL POOL

75-FT BUFFER ZONE TO VERNAL POOL

PROJECT LIMITS

PROPERTY LINE

GRAVEL

OBSCURED

STONE WALL

WF FENCE

DMH – NO RIM
I(A)=156.60 12"ASE
I(B)=156.37 12"ASE

157.06
INV OUT 12 RCP

157.10
INV OUT 12" RCP

RIM = 162.69
I(A)=156.60 12"ASE
I(B)=156.37 12"ASE

NO RIM
12"ASE
12"ASE

STREAM

SWAMP

PILE

DUGOUT

BENCH

SCORE BOARD

CONSESSION STAND

BASEBALL LIGHT POST

BATTING CAGE

ATHLETIC FIELD

GRASS ISLAND

FLAG POLE

JERSEY BARRIERS

BIT

SECURED

LANDFILL EDGE OF WASTE

CHANDLER ROAD

BENCHMARK: TBM-2
RAIL ROAD SPIKE SET 1' ABOVE GRADE IN BACK STOP.
ELEVATION = 190.36'

BENCHMARK: TBM-1
RAIL ROAD SPIKE SET 1' ABOVE GRADE IN UTILITY POLE #5226-90.
ELEVATION = 193.28'

WITHIN PROJECT LIMITS, REMOVE AND DISPOSE OFF SITE ALL ABOVE GROUND FEATURES AND FOUNDATIONS EXCEPT BLEACHERS OR AS NOTED

CUT AND PLUG BRANCH AT HYDRANT AND DELIVER HYDRANT TO TOWN

PLUG EXISTING 6" HYDRANT LATERAL AND ABANDON IN PLACE. REMOVE PIPE WITHIN LIMITS OF WASTE

REMOVE EXISTING TEE AND GATE VALVE AND REPLACE WITH DI PIPE AND SOLID SLEEVES

PLUG EXISTING 8" PIPE AND ABANDON IN PLACE

REMOVE GATE (NOT SHOWN) AND RELOCATE TO PROPOSED GREENWOOD ROAD ENTRANCE. SEE SHEET C-19

PROPOSED LEGEND

- CONCRETE PLUG FOR ABANDONED PIPE (2 / D-10)
- EXISTING SITE FEATURE TO BE REMOVED AND DISPOSED AS NOTED
- LIMIT OF VEGETATION CLEARING AND GRUBBING
- LIMIT OF PAVEMENT REMOVAL

NOTES:
1. FOR EXISTING CONDITIONS NOTES AND LEGEND, SEE SHEET G-2.
2. PRIOR TO REMOVALS, CALL TO CONFIRM DISCONNECT OF POWER; PULL ALL WIRES BACK TO POLE, LEAVE CONDUIT.
3. REMOVE AND DISPOSE OFF SITE ALL ABOVE GROUND WOODY VEGETATION. REMOVE AND GRIND STUMPS AND DISPOSE OF BENEATH CAP
4. FILL MANHOLES/HANDHOLES/CATCH BASINS, INDICATED ON THE PLANS TO BE ABANDONED WITH SHAPING SOIL.

RECORD DRAWING

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By Nathan E Jones Date 10/30/2025
NATHAN JONES
CDM Smith

1" = 40'
20 0 40

REV. NO.	DATE	DRWN	CHKD	REMARKS
4	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
3	3/2023	JRH	NEJ	UPDATED FOR BIDDING
2	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE / DPW MATERIALS HANDLING AREA
1	4/2017	JRH	NEJ	REVISED TO RESPOND TO CONSERVATON COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY: G. HOWARD
DRAWN BY: J. HEIL
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

CDM Smith
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TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

EXISTING CONDITIONS AND REMOVAL PLAN (SHEET 1 OF 4)

PROJECT NO. 0235-113811
FILE NAME: C001EXPLRD.DWG
SHEET NO. C-1

RECORD DRAWING

XREFs: [Wetland Survey Dwg - WSP 9.2.15, Final_Grading-Working, Full Site Survey Revised 5.11.16, C001GRPL, C001RMVL, 16365-CS-BN, CDMS_2436, 20250827 andover sheet 2.subgrade, 20250915 ANDOVER SHEET 4 FINAL GRADING] Images: []
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MATCH LINE – C–1

MATCH LINE C–3

PROPOSED LEGEND

- CONCRETE PLUG FOR ABANDONED PIPE (2 / D–10)
- EXISTING SITE FEATURE TO BE REMOVED AND DISPOSED AS NOTED
- LIMIT OF VEGETATION CLEARING AND GRUBBING
- LIMIT OF PAVEMENT REMOVAL

NOTES:
1. FOR EXISTING CONDITIONS NOTES AND LEGEND, SEE SHEET G–2.
2. PRIOR TO REMOVALS, CALL TO CONFIRM DISCONNECT OF POWER; PULL ALL WIRES BACK TO POLE, LEAVE CONDUIT.
3. REMOVE AND DISPOSE OFF SITE ALL ABOVE GROUND WOODY VEGETATION. REMOVE AND GRIND STUMPS AND DISPOSE OF BENEATH CAP
4. FILL MANHOLES/HANDHOLES/CATCH BASINS, INDICATED ON THE PLANS TO BE ABANDONED WITH SHAPING SOIL.

MANHOLES TO BE ABANDONED AS SPECIFIED

MANHOLES TO BE ABANDONED AS SPECIFIED

NON–JURISDICTIONAL STATE/LOCAL ISOLATED WETLANDS

WITHIN PROJECT LIMITS, REMOVE AND DISPOSE OFF SITE ALL ABOVE GROUND FEATURES AND FOUNDATIONS EXCEPT BLEACHERS OR AS NOTED

CATCH BASINS TO BE ABANDONED AS SPECIFIED

REMOVE AND RELOCATE GATE TO PROPOSED DPW FACILITY ENTRY ROAD, SEE SHEET C–18

BENCHMARK: TBM–3
LARGE MAG NAIL SET IN BASE OF 24" OAK TREE.
ELEVATION = 175.51'

PLUG AND ABANDON PIPES (2 / D–10)

MANHOLE TO BE ABANDONED AS SPECIFIED

PLUG AND ABANDON PIPE (2 / D–10)

CATCH BASINS TO BE ABANDONED AS SPECIFIED

NON–JURISDICTIONAL STATE/LOCAL ISOLATED WETLANDS

REMOVE AND DISPOSE OF BUILDING OFFSITE BY OTHERS

REMOVE GATE

PLUG AND ABANDON PIPES (2 / D–10)

PLUG VALVE AND REMOVE VALVE BOX

PLUG AND ABANDON PIPE (2 / D–10)

MANHOLE TO BE ABANDONED AS SPECIFIED

PLUG AND ABONDON PIPE (2 / D–10)

GREENWOOD ROAD

LEDGE ROAD

PROPERTY LINE

PROJECT LIMITS

100 FT. BUFFER

75 FT. NO BUILD

50 FT. NO DISTURBE

SILT FENCE

1" = 40'
20 0 40

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By _____ Date 10/30/2025
NATHAN JONES
CDM Smith

REV. NO.	DATE	DRWN	CHKD	REMARKS
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2	3/2023	JRH	NEJ	UPDATED FOR BIDDING
1	11/2022	KAR	NEJ	REMOVED POST–CLOSURE USE / DPW MATERIALS HANDLING AREA

DESIGNED BY: G. HOWARD
DRAWN BY: J. HEIL
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

CDM Smith
75 State Street, Suite 701
Boston, MA 02109
Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

EXISTING CONDITIONS AND REMOVAL PLAN (SHEET 2 OF 4)

PROJECT NO. 0235–113811
FILE NAME: C002EXPLRD.DWG
SHEET NO. C-2

RECORD DRAWING

MATCH LINE – C-4

PROTECT 24" DIA. CULVERT

PROTECT 12" DIA. CULVERT

DECOMMISSION MONITORING WELLS

BENCHMARK: TBM-5
RAILROAD SPIKE SET IN
BASE OF 18" PINE TREE.
ELEVATION = 154.32'

WITHIN PROJECT LIMITS, REMOVE AND DISPOSE OFF SITE ALL ABOVE GROUND FEATURES AND FOUNDATIONS EXCEPT BLEACHERS OR AS NOTED

PROJECT LIMITS

PROPERTY LINE

ACCESS ROAD

DECOMMISSION MONITORING WELLS

PROPERTY LINE

LANDFILL EDGE OF WASTE

NON-JURISDICTIONAL STATE/LOCAL ISOLATED WETLANDS

REMOVE AND DISPOSE OF BUILDING OFFSITE BY OTHERS

REMOVE AND DISPOSE OF HEADWALL

50 FOOT WIDE DRAIN EASEMENT (BOOK 1191, PAGE 656)

PROPERTY LINE

50 FT NO DISTURB

75 FT NO BUILD

100 FT BUFFER

PROPERTY LINE

PROJECT LIMITS

2 D-10 PLUG AND ABONDON PIPES

MANHOLE TO BE ABANDONED AS SPECIFIED

PROTECT EXISTING GATE

REMOVE AND DISPOSE OF PAVEMENT. RELOCATE TEMPORARY ACCESS ROUTE AS SHOWN ON SHEET G-4.

BENCHMARK: TBM-4
RAIL ROAD SPIKE SET IN
BASE OF 14" OAK TREE.
ELEVATION = 162.54'

PROTECT EXISTING TREES (TYP. ALONG PAVEMENT REMOVAL AREA)

PETTINGELL AVENUE

MATCH LINE C-2

PROPOSED LEGEND

- CONCRETE PLUG FOR ABANDONED PIPE — 2 / D-10
- EXISTING SITE FEATURE TO BE REMOVED AND DISPOSED AS NOTED
- LIMIT OF VEGETATION CLEARING AND GRUBBING
- LIMIT OF PAVEMENT REMOVAL

NOTES:
1. FOR EXISTING CONDITIONS NOTES AND LEGEND, SEE SHEET G-2.
2. PRIOR TO REMOVALS, CALL TO CONFIRM DISCONNECT OF POWER; PULL ALL WIRES BACK TO POLE, LEAVE CONDUIT.
3. REMOVE AND DISPOSE OFF SITE ALL ABOVE GROUND WOODY VEGETATION. REMOVE AND GRIND STUMPS AND DISPOSE OF BENEATH CAP
4. FILL MANHOLES/HANDHOLES/CATCH BASINS, INDICATED ON THE PLANS TO BE ABANDONED WITH SHAPING SOIL.

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By _____ Date 10/30/2025

NATHAN JONES
CDM Smith

1" = 40'
20 0 40

REV. NO.	DATE	DRWN	CHKD	REMARKS
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2	3/2023	JRH	NEJ	UPDATED FOR BIDDING
1	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE / DPW MATERIALS HANDLING AREA

DESIGNED BY: G. HOWARD
DRAWN BY: J. HEIL
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

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TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

EXISTING CONDITIONS AND REMOVAL PLAN (SHEET 3 OF 4)

PROJECT NO. 0235-113811
FILE NAME: C003EXPLRD.DWG

SHEET NO.
C-3

RECORD DRAWING

XREFs: [Wetland Survey Dwg – WSP 9.2.15, Final_Grading-Working, Full Site Survey Revised 5.11.16, C001GRPL, C001RMVL, 16365-CS-BN, CDMS_2436, 20250915 ANDOVER, SHEET 4.FINAL GRADING] Images: []
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20250827 andover sheet 3.liner, 20250827 ANDOVER. SHEET 1. CULVERT, 20250827 andover. sheet 2.subgrade,

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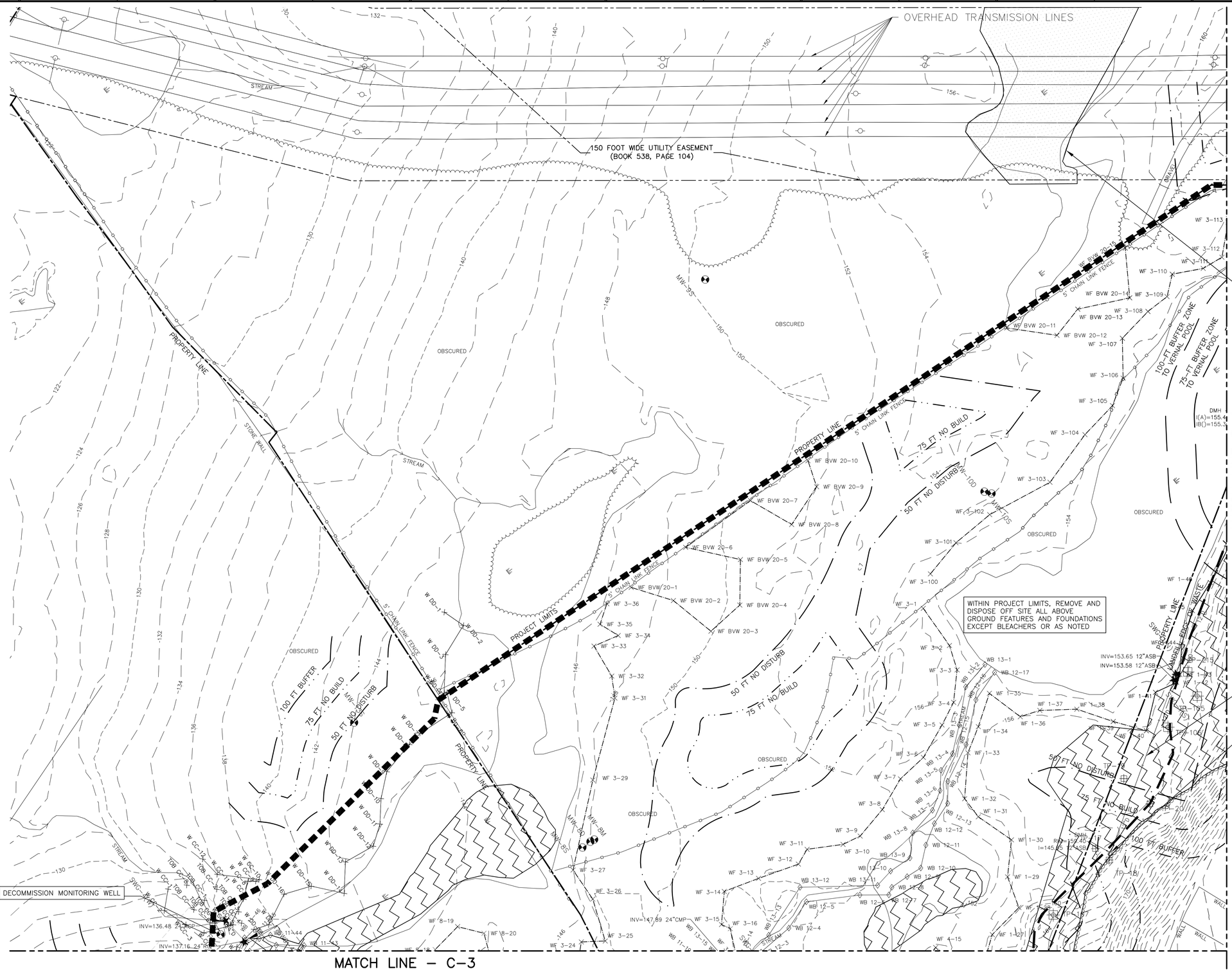

PROPOSED LEGEND

- CONCRETE PLUG FOR ABANDONED PIPE (2 / D-10)
- EXISTING SITE FEATURE TO BE REMOVED AND DISPOSED AS NOTED
- LIMIT OF VEGETATION CLEARING AND GRUBBING
- LIMIT OF PAVEMENT REMOVAL

NOTES:
1. FOR EXISTING CONDITIONS NOTES AND LEGEND, SEE SHEET G–2.
2. PRIOR TO REMOVALS, CALL TO CONFIRM DISCONNECT OF POWER; PULL ALL WIRES BACK TO POLE, LEAVE CONDUIT.
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RECORD DRAWING

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By NATHAN JONES Date 10/30/2025

CDM Smith

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1	11/2022	KAR	NEJ	REMOVED POST–CLOSURE USE / DPW MATERIALS HANDLING AREA

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APPROVED BY: N. JONES
DATE: OCTOBER 2025

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TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

EXISTING CONDITIONS AND REMOVAL PLAN (SHEET 4 OF 4)

PROJECT NO. 0235–113811
FILE NAME: C004EXPLRD.DWG
SHEET NO. C-4

RECORD DRAWING

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VERNAL POOLS

OVERHEAD TRANSMISSION LINES

150 FOOT WIDE UTILITY EASEMENT (BOOK 538, PAGE 104)

SHEET MATCH LINE
SHEET MATCH LINE

PERMANENT ALTERATION TO 540 SF OF WATERS OF THE U.S.

WETLAND SOIL REMOVAL AREA #1 – TEMPORARY ALTERATION OF APPROX. 200 SF OF WATERS OF THE U.S.

IW–A, PERMANENT ALTERATION TO 1,522 SF NEIGHBORING WETLANDS REGULATED AS WATERS OF THE U.S.

WETLAND SOIL REMOVAL AREA #2 – TEMPORARY ALTERATION OF APPROX. 900 SF OF WATERS OF THE U.S.

PERMANENT ALTERATION WATERS 1,350 SF OF THE U.S.

WETLAND SOIL REMOVAL AREA #3 – TEMPORARY ALTERATION OF APPROX. 3,800 SF OF WATERS OF THE U.S.

WETLAND SOIL REMOVAL AREA #4 – TEMPORARY ALTERATION OF APPROX. 1,000 SF OF WATERS OF THE U.S.

WETLAND SOIL REMOVAL AREA #5 – TEMPORARY ALTERATION OF APPROX. 13,600 SF OF WATERS OF THE U.S.

WETLAND SOIL REMOVAL AREA #6 – TEMPORARY ALTERATION OF APPROX. 3,350 SF OF WATERS OF THE U.S.

IW–B, TEMPORARY ALTERATION TO 304 SF NEIGHBORING WETLANDS REGULATED AS WATERS OF THE U.S.

WETLAND SOIL REMOVAL AREA #7 – TEMPORARY ALTERATION OF APPROX. 2,350 SF OF WATERS OF THE U.S. TEMPORARY ALTERATION TO 110 LF BANK

IW–F, PERMANENT ALTERATION TO 1,522 SF NEIGHBORING WETLANDS REGULATED AS WATERS OF THE U.S.

PERMANENT ALTERATION TO BANK: 48 LF

PERMANENT ALTERATION TO 4,700 SF OF WATERS OF THE U.S.
PERMANENT ALTERATION TO BANK: 190 LF

SHEET 1 OF 3

SHEET 2 OF 3

SHEET 3 OF 3

100 FT BUFFER
75 FT. NO BUILD
50 FT NO DISTURB

75 FT NO BUILD
50 FT NO DISTURB

50 FT NO DISTURB
75 FT NO BUILD
100 FT BUFFER

100 FT BUFFER ZONE TO VERNAL POOL

BENCHMARK: PIN/CB RAIL ROAD SPIKE SET 1" ABOVE GRADE IN BACK STOP. ELEVATION = 199.96'

BENCHMARK: PIN/CB RAIL ROAD SPIKE SET 1" ABOVE GRADE IN UTILITY POLE #5225-30. ELEVATION = 193.28'

BENCHMARK: PIN/CB RAIL ROAD SPIKE SET IN BASE OF 18" PINE TREE. ELEVATION = 164.56'

BENCHMARK: PIN/CB RAIL ROAD SPIKE SET IN BASE OF 14" OAK TREE. ELEVATION = 164.56'

50 FOOT WIDE DRAIN EASEMENT (BOOK 1191, PAGE 208)

PROPERTY LINE

PROPOSED LEGEND

- WASTE RELOCATION AREA
- TEMPORARY WETLAND IMPACT AREAS
- PERMANENT WETLAND IMPACT AREAS
- ISOLATED WETLANDS
- PERMANENT ISOLATED WETLAND IMPACT AREAS
- EDGE OF LLDPE CAP
- APPROX. EDGE OF WASTE

EXISTING LEGEND SEE SHEET G–2

WETLAND BB, ISOLATED WETLAND

WETLAND B, ISOLATED WETLAND

WETLAND A, PERMANENT ALTERATION TO 301 SF NEIGHBORING WETLANDS REGULATED AS WATERS OF THE U.S.

(2) C–6 WASTE RELOCATION FOCUS PLAN 2

(1) C–6 WASTE RELOCATION FOCUS PLAN 1

(3) C–6 WASTE RELOCATION FOCUS PLAN 3

IW–C, ISOLATED WETLAND

WETLAND 7, NON–JURISDICTIONAL FEDERAL WETLAND

(4) C–6 WASTE RELOCATION FOCUS PLAN 4

IW–D, ISOLATED WETLANDS

RECORD DRAWING

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By _____ Date 10/30/2025
NATHAN JONES
CDM Smith

1" = 80'
40 0 80

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DRAWN BY: N. JONES
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APPROVED BY: N. JONES
DATE: OCTOBER 2025

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75 State Street, Suite 701
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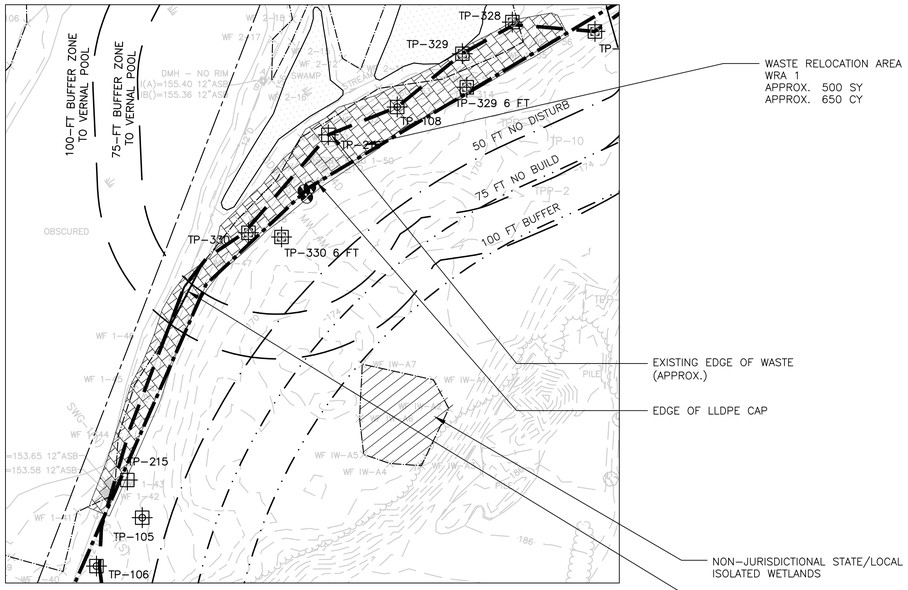
TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

WASTE RELOCATION KEY PLAN / WETLAND SOILS REMEDIATION KEY PLAN

PROJECT NO. 0235–113811
FILE NAME: C005WRLPRD.DWG

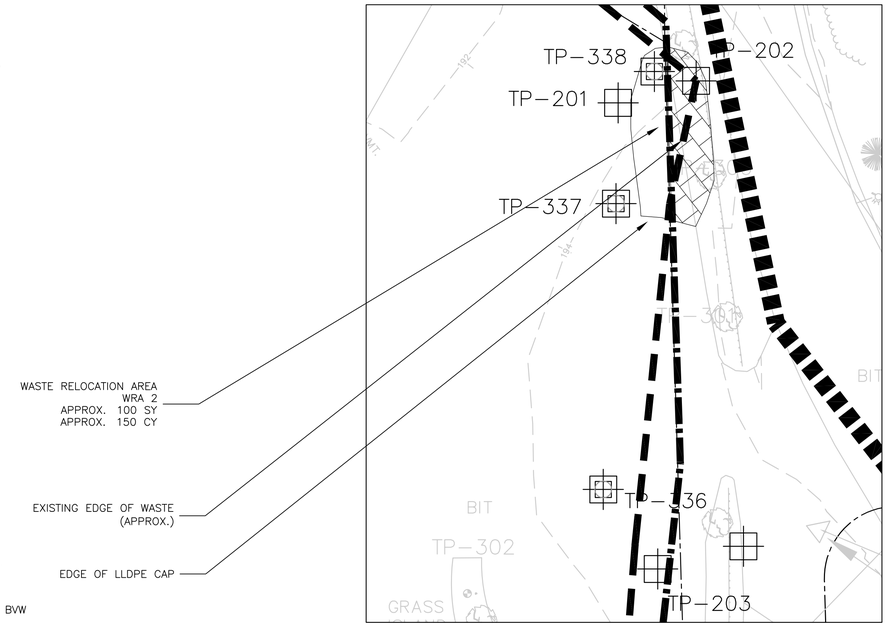
SHEET NO.
C-5

RECORD DRAWING



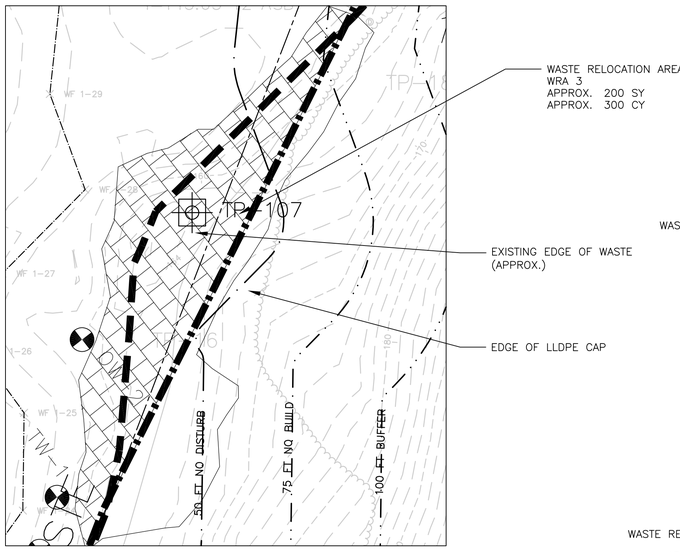
WASTE RELOCATION FOCUS PLAN 1

PLAN 1 C-6 — 1"=40'



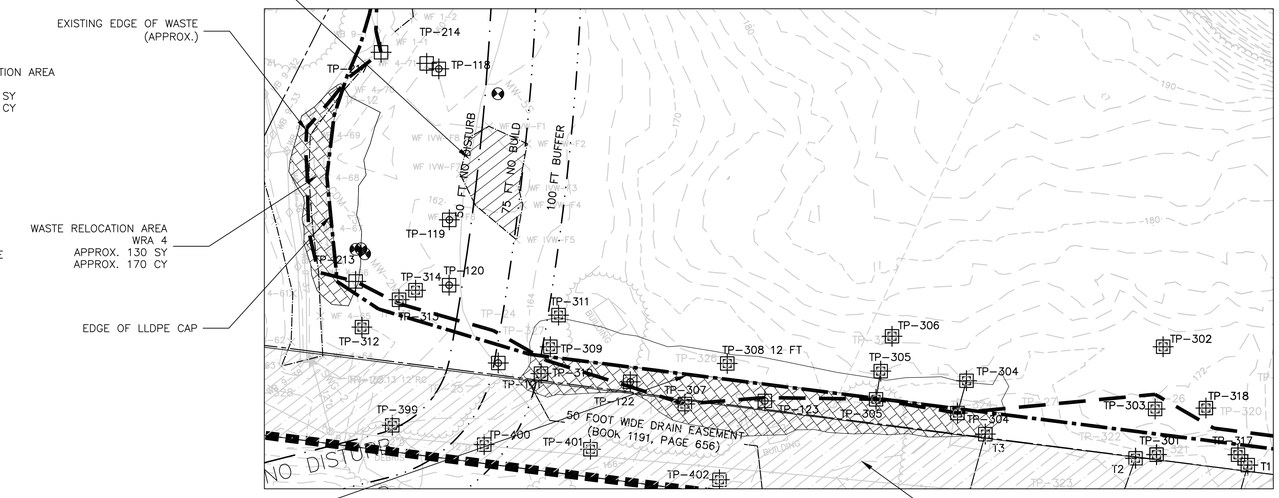
WASTE RELOCATION FOCUS PLAN 2

PLAN 2 C-6 — 1"=20'



WASTE RELOCATION FOCUS PLAN 3

PLAN 3 C-6 — 1"=20'



WASTE RELOCATION FOCUS PLAN 4

PLAN 4 C-6 — 1"=40'

PROPOSED LEGEND

- WASTE RELOCATION AREA
- APPROX. EDGE OF WASTE
- EDGE OF LLDPE CAP

EXISTING LEGEND SEE SHEET G-2

GENERAL WASTE RELOCATION NOTES:

1. REFER TO SHEET C-5 FOR NOTES AND GENERAL SHEET VIEW DISTRIBUTION. REFER TO SHEET G-2 FOR GENERAL NOTES.
2. PROPOSED CAP SUBGRADE CONTOURS AND GRADES SHOWN ON SHEETS C-10 THROUGH C-13.
3. AT ALL WASTE RELOCATION AREAS, CONTRACTOR SHALL RETAIN A LICENSED LAND SURVEYOR TO CONFIRM AND STAKE THE LOCATION OF ALL PROPERTY LINES AND EASEMENTS PRIOR TO CONDUCTING ANY CONSTRUCTION ACTIVITIES ON-SITE.
4. CONTRACTOR MAY BE REQUIRED BY THE ENGINEER TO PERFORM FURTHER TEST PITS WITHIN THE PROPOSED WASTE RELOCATION AREAS TO CONFIRM EDGE OF WASTE AND DEPTHS.
5. MINIMIZE DISTURBANCE TO PRIVATE PROPERTY.
7. ALL WASTE SHALL BE RELOCATED TO WITHIN THE CAPPING LIMITS OUTSIDE PROPOSED DPW MATERIALS HANDLING AREA AND COVERED IN ACCORDANCE WITH MASSDEP REGULATIONS. SEE SHEET C-7 FOR SPECIFIC LOCATION.
8. CONTRACTOR SHALL PROVIDE PLAN PREPARED AND STAMPED BY A LICENSED LAND SURVEYOR SHOWING THE LOCATION OF ALL PROPERTY LINES AND EASEMENTS, LOCATION OF ANY UTILITIES, VERTICAL AND HORIZONTAL LIMITS OF EXCAVATION, LOCATION OF ANY CONFIRMATORY TESTING, FINAL EDGE OF LANDFILLED WASTE AND THE FINAL ELEVATIONS WITHIN ANY WASTE RELOCATION AREA PRIOR TO THE PLACEMENT OF THE LLDPE FML.

RECORD DRAWING

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By _____ Date 10/30/2025

NATHAN JONES

CDM Smith

REV. NO.	DATE	DRWN	CHKD	REMARKS
3	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
2	3/2023	JRH	NEJ	UPDATED FOR BIDDING
1	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE / DPW MATERIALS HANDLING AREA

DESIGNED BY: N. JONES
DRAWN BY: N. JONES
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

CDM Smith
75 State Street, Suite 701
Boston, MA 02109
Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

WASTE RELOCATION FOCUS PLANS

PROJECT NO. 0235-113811
FILE NAME: C006WRLPRD.DWG

SHEET NO. C-6

RECORD DRAWING

XREFs: [Wetland Survey Dwg - WSP 9.2.15, Final_Grading-Working, Full Site Survey Revised 5.11.16, C001GRPL, CDMS_2436, 20250827 andover sheet 3.liner, 20250827 ANDOVER. SHEET 1. CULVERT, 20250827 andover. sheet 2.subgrade, 20250915 ANDOVER. SHEET 4.FINAL GRADING] Images: []
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pw:\\cdmsmith-az02-pw.bentley.com:pw_p11\0235\113811\04 Design Services NM_1002%02 Civil\10 CADD\2025 RECORD DRAWINGS\C006WRLPRD.dwg
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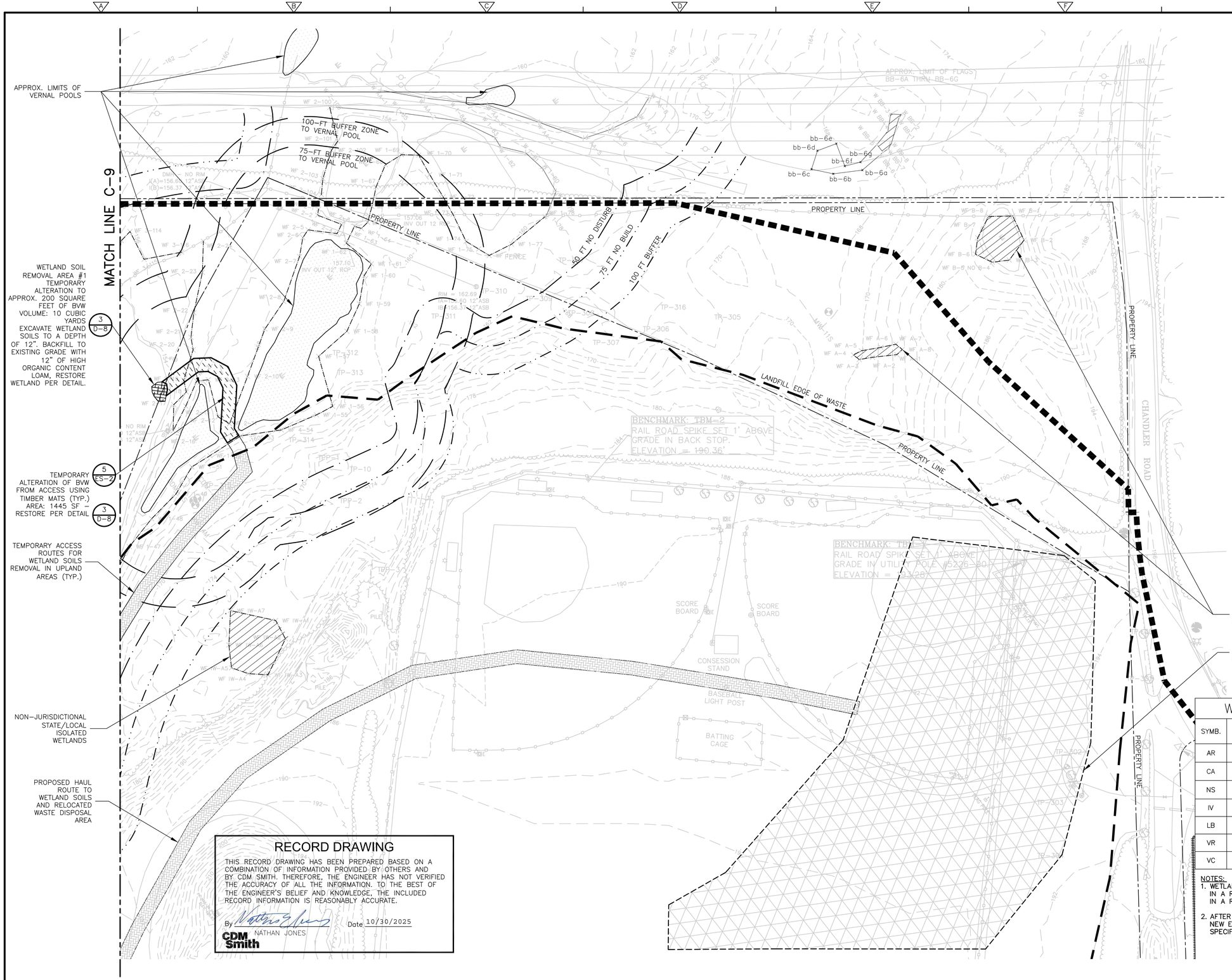
APPROX. LIMITS OF VERNAL POOLS
100-FT BUFFER ZONE TO VERNAL POOL
75-FT BUFFER ZONE TO VERNAL POOL
MATCH LINE C-9
PROPERTY LINE
50 FT NO DISTURB
75 FT NO BUILD
100 FT BUFFER
WETLAND SOIL REMOVAL AREA #1 TEMPORARY ALTERATION TO APPROX. 200 SQUARE FEET OF BVW VOLUME: 10 CUBIC YARDS EXCAVATE WETLAND SOILS TO A DEPTH OF 12". BACKFILL TO EXISTING GRADE WITH 12" OF HIGH ORGANIC CONTENT LOAM, RESTORE WETLAND PER DETAIL.
3 D-8
TEMPORARY ALTERATION OF BVW FROM ACCESS USING TIMBER MATS (TYP.) AREA: 1445 SF – RESTORE PER DETAIL
5 ES-2
3 D-8
TEMPORARY ACCESS ROUTES FOR WETLAND SOILS REMOVAL IN UPLAND AREAS (TYP.)
NON-JURISDICTIONAL STATE/LOCAL ISOLATED WETLANDS
PROPOSED HAUL ROUTE TO WETLAND SOILS AND RELOCATED WASTE DISPOSAL AREA
LANDFILL EDGE OF WASTE
APPROX. LIMIT OF FLAGS BB-6A THRU BB-6G
BENCHMARK: TBM-2 RAIL ROAD SPIKE SET 1' ABOVE GRADE IN BACK STOP. ELEVATION = 190.36'
BENCHMARK: TBM-1 RAIL ROAD SPIKE SET 1' ABOVE GRADE IN UTILITY POLE #6226-20 ELEVATION = 193.28'
CHANDLER ROAD
SCORE BOARD
CONSESSION STAND
BASEBALL LIGHT POST
BATTING CAGE
NON-JURISDICTIONAL STATE/LOCAL ISOLATED WETLANDS
AREA DESIGNATED FOR DRYING AND FINAL DISPOSAL OF WETLAND SOILS AND RELOCATED WASTE. SEE NOTES 7 AND 8.

PROPOSED LEGEND

- AREAS DESIGNATED FOR REMOVAL BASED ON ARSENIC CONCENTRATIONS
- UPLAND TEMPORARY ACCESS ROUTES TO WETLAND SOIL REMOVAL AREAS. CONTRACTOR TO IMPROVE ACCESS ROUTES AS REQUIRED IN ORDER TO PERFORM THE WORK. CONTRACTOR SHALL RESTORE DISTURBED AREAS OUTSIDE OF CAP LIMITS TO EXISTING CONDITIONS.
- ANTICIPATED TIMBER MAT ACCESS TO WETLAND SOIL REMOVAL AREAS. CONTRACTOR TO REMOVE AND RESTORE AREA TO EXISTING CONDITIONS FOLLOWING ARSENIC REMOVAL OPERATIONS
- APPROXIMATE LOCATION OF TEMPORARY COFFER DAM. CONTRACTOR MAY PROPOSE ALTERNATIVE LOCATIONS
- PROPOSED HAUL ROUTE TO TOP OF LANDFILL AND WETLAND SOILS DRYING / DISPOSAL AREA. CONTRACTOR MAY PROPOSE ALTERNATIVE ROUTES.
- AREA DESIGNATED FOR WETLAND SOIL DRYING, AND FINAL DISPOSAL OF WETLAND SOILS AND RELOCATED WASTE

EXISTING LEGEND SEE SHEET G-2

NOTES:

1. WETLAND SOIL AREAS DESIGNATED FOR REMOVAL SHALL BE STAKED BY THE CONTRACTOR IN THE FIELD, AND APPROVED BY THE ENGINEER BEFORE REMOVAL.
2. ALL WETLAND SOILS REMOVED SHALL BE TRANSPORTED DIRECTLY TO THE LANDFILL IN VACUUM EXCAVATOR OR TRUCKS LINED WITH POLYETHYLENE SHEETING TO CONTAIN FREE LIQUIDS VIA ONSITE ROUTES AND SHALL BE DISPOSED UNDER THE LANDFILL CAP BEFORE LANDFILL CAP CONSTRUCTION.
3. WETLAND SOILS SHALL NOT BE TRANSPORTED ON PUBLIC ROADWAYS.
4. FINAL DISPOSAL OF WETLAND SOILS SHALL BE WITHIN THE DESIGNATED AREA AS SHOWN ON SHEET C-7.
5. NO HEAVY EQUIPMENT SHALL BE USED WITHIN WETLAND LIMITS OUTSIDE THE DESIGNATED REMOVAL AREAS AND ACCESS ROUTES.
6. MATERIALS USED FOR THE INSTALLATION OF COFFERDAMS AND TO CONSTRUCT TEMPORARY ACCESS ROUTES AND TIMBER MATS SHALL BE REMOVED FOLLOWING COMPLETION OF WETLAND RESTORATION.
7. WETLAND SOILS DRYING AREA TO BE LINED WITH A MINIMUM THICKNESS OF 20 MIL LINER AND BERMED (18-IN HIGH) ON ALL FOUR SIDES TO CONTAIN FREE LIQUIDS. WETLAND SOILS TO BE DISPOSED IN THE LANDFILL UNDER THE CAP PRIOR TO CAP CONSTRUCTION ONCE FREE LIQUIDS ARE NO LONGER PRESENT. ANY LIQUIDS THAT DO NOT EVAPORATE SHALL BE DRUMMED AND DISPOSED OFFSITE.
8. MAXIMUM THICKNESS OF DEPOSITED WETLAND SOILS AND RELOCATED WASTE UNDER THE CAP SHALL NOT EXCEED 12-INCHES.
9. NO CLEARING OUTSIDE CLEARING LIMITS FOR PROJECT SHALL BE PERMITTED WITH THE EXCEPTION OF THE DESIGNATED REMOVAL AREAS AND ACCESS ROUTES. TREES OUTSIDE CLEARING LIMITS AND DESIGNATED REMOVAL AREAS AND ACCESS ROUTES SHALL BE PROTECTED.
10. TO THE EXTENT POSSIBLE, PERFORM WETLAND SOILS REMOVAL DURING A DRY PERIOD.

WETLAND RESTORATION PLANT SCHEDULE

SYMB.	COMMON NAME	LATIN NAME	CONTAINER	APP. HEIGHT	COMMENTS
AR	RED MAPLE	ACER RUBRUM	1.0-1.5" CALIPER		SPACE 15-FT OC
CA	SILKY DOGWOOD	CORNUS AMOMUM	#2	4'-5'	SPACE 10.5-FT OC
NS	BLACKGUM	NYSSA SYLVATICA	2.5-3.0" CALIPER		SPACE 15-FT OC
IV	WINTERBERRY	ILEX VERTICILLATA	#2	4'-5'	SPACE 10.5-FT OC
LB	SPICEBUSH	LONICERA BENZOIN	#2	4'-5'	SPACE 10.5-FT OC
VR	NORTHERN ARROWWOOD	VIBURNUM RECOGNITUM	#2	4'-5'	SPACE 10.5-FT OC
VC	HIGHBUSH BLUEBERRY	VACCINIUM CORYMBOSUM	#2	4'-5'	SPACE 10.5-FT OC

NOTES:

1. WETLAND RESTORATION – PLANT 194 TREES PER ACRE AT APPROX. 15 FT. ON CENTER IN A RANDOM PATTERN. PLANT 400 SHRUBS PER ACRE APPROX. 10.5 FT. ON CENTER IN A RANDOM PATTERN.
2. AFTER PLANTING TREES AND SHRUBS, SOW WITH NEW ENGLAND WETLAND PLANTS INC., NEW ENGLAND WETMIX, OR EQUAL, IN ACCORDANCE WITH SECTION 02955 AT THE SPECIFIED RATE PER SUPPLIER.

N

1" = 40'
20 0 40

RECORD DRAWING

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By NATHAN JONES Date 10/30/2025

CDM Smith

REV. NO.	DATE	DRWN	CHKD	REMARKS
5	0/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
4	3/2023	JRH	NEJ	UPDATED FOR BIDDING
3	1/2022	KAR	NEJ	REMOVED POST-CLOSURE USE / DPW MATERIALS HANDLING AREA
2	1/2018	JRH	NEJ	REVISED TO RESPOND TO MASSDEP 12/14/2017 NOTICE OF TECHNICAL DEFICIENCY
1	3/2017	NEJ	MHL	REVISED TO RESPOND TO CONSERVATION COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY: E. SCHICK
DRAWN BY: E. SCHICK
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: D. GUGLIELMI
DATE: MARCH 2017

CDM Smith
75 State Street, Suite 701
Boston, MA 02109
Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

WETLAND SOILS REMEDIATION PLAN (SHEET 1 OF 3)

PROJECT NO. 0235-113811
FILE NAME: C007-SRPL.DWG
SHEET NO. C-7

100% CORRECTIVE ACTION DESIGN SUBMITTAL - NOT FOR CONSTRUCTION

XREFs: [CDMS_2436, Wetland Survey Dwg - WSP 9.2.15, Final_Grading-Working, Full Site Survey Revised 5.11.16, C001GRPL, C06AEXWP] Images: []
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XREFs: [Wetland Survey Dwg – WSP 9.2.15, Final_Grading-Working, Full Site Survey Revised 5.11.16, C001GRPL, C06AEXWP, 16365-CS-BN, CDMS_2436, 20250915 ANDOVER, SHEET 4.FINAL GRADING] Images: []
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MATCH LINE – C-9

3/D-8 WETLAND SOIL REMOVAL AREA #5
TEMPORARY ALTERATION OF APPROX. 13,600 SQUARE FEET OF BVW
VOLUME: 500 CUBIC YARDS
EXCAVATE WETLAND SOILS TO A DEPTH OF 12". BACKFILL TO EXISTING GRADE WITH HIGH ORGANIC CONTENT LOAM, RESTORE WETLANDS PER DETAIL

1/D-9 WETLAND SOIL REMOVAL AREA #4
TEMPORARY ALTERATION TO APPROX. 1,000 SQUARE FEET OF LUW
VOLUME: 40 CUBIC YARDS
EXCAVATE WETLAND SOILS FROM INTERMITTENT STREAM CHANNEL BOTTOM TO A DEPTH OF 12" USING VACUUM EXCAVATOR OR OTHER HAND METHODS. NO HEAVY EQUIPMENT OR MACHINERY WILL BE PERMITTED IN RESOURCE AREA.
BACKFILL TO EXISTING GRADE WITH 6" OF COMMON FILL AND 6" OF STREAMBED MATERIAL PER SPEC. SECTION 02975

WETLAND SOIL REMOVAL AREA #6
TEMPORARY ALTERATION TO APPROX. 3,350 SQUARE FEET OF LUW
VOLUME: 120 CUBIC YARDS
EXCAVATE WETLAND SOILS FROM INTERMITTENT STREAM CHANNEL BOTTOM TO A DEPTH OF 12" USING VACUUM EXCAVATOR OR OTHER HAND METHODS. NO HEAVY EQUIPMENT OR MACHINERY WILL BE PERMITTED IN RESOURCE AREA.
BACKFILL TO EXISTING GRADE WITH 6" OF COMMON FILL AND 6" OF STREAMBED MATERIAL PER SPEC. SECTION 02975
1/D-9

TEMPORARY ALTERATION OF BVW FROM ACCESS USING TIMBER MATS.
AREA: APPROX. 40 SQUARE FEET
5/ES-2

APPROXIMATE LOCATION OF TEMPORARY COFFER DAM. DIVERT TO DIVERSION DISCHARGE POINT
AREA: 50 SQUARE FEET
1/D-8

INSTALL SNAGS (TYP.) 8/D-8

TEMPORARY ALTERATION OF BVW FROM ACCESS USING TIMBER MATS.
AREA: 60 SQUARE FEET– RESTORE PER DETAIL
5/ES-2
3/D-8

APPROXIMATE LOCATION OF TEMPORARY COFFER DAM. DIVERT TO DIVERSION DISCHARGE POINT
AREA: 100 SQUARE FEET
1/D-8

TEMPORARY ACCESS ROUTES FOR WETLAND SOILS REMOVAL IN UPLAND AREAS (TYP.)

TEMPORARY STAGING AREA FOR MATERIALS AND EQUIPMENT FOR WETLAND SOILS REMOVAL OPERATIONS (APPROXIMATE)

RESTORE DISTURBED BANKS (TYP.) 6/ES-2

PROPOSED HAUL ROUTE TO WETLAND SOILS AND RELOCATED WASTE DISPOSAL AREA

NON-JURISDICTIONAL STATE/LOCAL ISOLATED WETLANDS

WETLAND SOIL REMOVAL AREA #7
TEMPORARY ALTERATION OF APPROX. 2,350 SQUARE FEET OF LUW AND APPROX. 110 LINEAR FEET OF BANK
VOLUME: 130 CUBIC YARDS
EXCAVATE WETLAND SOILS TO A DEPTH OF 12". BACKFILL TO EXISTING GRADE WITH 12" HIGH ORGANIC CONTENT LOAM. SEED WITH WETLAND SEED MIXTURE AT A RATE OF 11 LB/ 2,500 SF.

PROTECT EXISTING TREES ADJACENT TO TEMPORARY ACCESS ROUTE (TYP. BOTH SIDES)

100 FT BUFFER
75 FT NO BUILD
50 FT NO DISTURB
PROPERTY LINE
50 FOOT WIDE DRAIN EASEMENT (BOOK 1191, PAGE 656)
LANDFILL EDGE OF WASTE
BENCHMARK: TBM-4
ELEVATION = 162.54'
PETTINGELL AVENUE

1" = 40'
20 0 40

PROPOSED LEGEND

- AREAS DESIGNATED FOR REMOVAL BASED ON ARSENIC CONCENTRATIONS
- UPLAND TEMPORARY ACCESS ROUTES TO WETLAND SOIL REMOVAL AREAS. CONTRACTOR TO IMPROVE ACCESS ROUTES AS REQUIRED IN ORDER TO PERFORM THE WORK. CONTRACTOR SHALL RESTORE DISTURBED AREAS OUTSIDE OF CAP LIMITS TO EXISTING CONDITIONS.
- ANTICIPATED TIMBER MAT ACCESS TO WETLAND SOIL REMOVAL AREAS. CONTRACTOR TO REMOVE AND RESTORE AREA TO EXISTING CONDITIONS FOLLOWING WETLAND SOIL REMOVAL
- APPROXIMATE LOCATION OF TEMPORARY COFFER DAM. CONTRACTOR MAY PROPOSE ALTERNATIVE LOCATIONS
- PROPOSED HAUL ROUTE TO TOP OF LANDFILL AND WETLAND SOILS DRYING / DISPOSAL AREA. CONTRACTOR MAY PROPOSE ALTERNATIVE ROUTES.

EXISTING LEGEND SEE SHEET G-2

NOTES:
1. WETLAND SOIL AREAS DESIGNATED FOR REMOVAL SHALL BE STAKED BY THE CONTRACTOR IN THE FIELD, AND APPROVED BY THE ENGINEER BEFORE REMOVAL.
2. ALL WETLAND SOILS REMOVED SHALL BE TRANSPORTED DIRECTLY TO THE LANDFILL IN VACUUM EXCAVATOR OR TRUCKS LINED WITH POLYETHYLENE SHEETING TO CONTAIN FREE LIQUIDS VIA ONSITE ROUTES AND SHALL BE DISPOSED UNDER THE LANDFILL CAP BEFORE LANDFILL CAP CONSTRUCTION.
3. WETLAND SOILS SHALL NOT BE TRANSPORTED ON PUBLIC ROADWAYS.
4. FINAL DISPOSAL OF WETLAND SOILS SHALL BE WITHIN THE DESIGNATED AREA AS SHOWN ON SHEET C-7.
5. NO HEAVY EQUIPMENT SHALL BE USED WITHIN WETLAND LIMITS OUTSIDE THE DESIGNATED REMOVAL AREAS AND ACCESS ROUTES.
6. MATERIALS USED FOR THE INSTALLATION OF COFFERDAMS AND TO CONSTRUCT TEMPORARY ACCESS ROUTES AND TIMBER MATS SHALL BE REMOVED FOLLOWING COMPLETION OF WETLAND RESTORATION.
7. WETLAND SOILS DRYING AREA TO BE LINED WITH A MINIMUM THICKNESS OF 20 MIL LINER AND BERMED (18-IN HIGH) ON ALL FOUR SIDES TO CONTAIN FREE LIQUIDS. WETLAND SOILS TO BE DISPOSED IN THE LANDFILL UNDER THE CAP PRIOR TO CAP CONSTRUCTION ONCE FREE LIQUIDS ARE NO LONGER PRESENT. ANY LIQUIDS THAT DO NOT EVAPORATE SHALL BE DRUMMED AND DISPOSED OFFSITE.
8. MAXIMUM THICKNESS OF DEPOSITED WETLAND SOILS AND RELOCATED WASTE UNDER THE CAP SHALL NOT EXCEED 12-INCHES.
9. NO CLEARING OUTSIDE CLEARING LIMITS FOR PROJECT SHALL BE PERMITTED WITH THE EXCEPTION OF THE DESIGNATED REMOVAL AREAS AND ACCESS ROUTES. TREES OUTSIDE CLEARING LIMITS AND DESIGNATED REMOVAL AREAS AND ACCESS ROUTES SHALL BE PROTECTED.
10. TO THE EXTENT POSSIBLE, PERFORM WETLAND SOILS REMOVAL DURING A DRY PERIOD.
11. ONCE WETLAND SOILS NO LONGER CONTAIN FREE LIQUIDS AS DETERMINED BY THE ENGINEER, PLACE IN DESIGNATED DISPOSAL AREA. PLACE MIN. 6-INCHES DAILY COVER OVER WETLAND SOILS AFTER PLACING IN DESIGNATED FINAL DISPOSAL AREA.

DEFINITIONS:
BVW – BORDERING VEGETATED WETLAND
LUW – LAND UNDER WATER

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By NATHAN JONES Date 10/30/2025

CDM Smith

WETLAND RESTORATION PLANT SCHEDULE

SYMB.	COMMON NAME	LATIN NAME	CONTAINER	APP. HEIGHT	COMMENTS
AR	RED MAPLE	ACER RUBRUM	1.0–1.5" CALIPER		SPACE 15–FT OC
CA	SILKY DOGWOOD	CORNUS AMOMUM	#2	4'–5'	SPACE 10.5–FT OC
NS	BLACKGUM	NYSSA SYLVATICA	2.5–3.0" CALIPER		SPACE 15–FT OC
IV	WINTERBERRY	ILEX VERTICILLATA	#2	4'–5'	SPACE 10.5–FT OC
LB	SPICEBUSH	LONICERA BENZOIN	#2	4'–5'	SPACE 10.5–FT OC
VR	NORTHERN ARROWWOOD	VIBURNUM RECOGNITUM	#2	4'–5'	SPACE 10.5–FT OC
VC	HIGHBUSH BLUEBERRY	VACCINIUM CORYMBOSUM	#2	4'–5'	SPACE 10.5–FT OC

NOTES:
1. WETLAND RESTORATION – PLANT 194 TREES PER ACRE AT APPROX. 15 FT. ON CENTER IN A RANDOM PATTERN. PLANT 400 SHRUBS PER ACRE APPROX. 10.5 FT. ON CENTER IN A RANDOM PATTERN.
2. AFTER PLANTING TREES AND SHRUBS, SOW WITH NEW ENGLAND WETLAND PLANTS INC., NEW ENGLAND WETMIX, OR EQUAL, IN ACCORDANCE WITH SECTION 02955 AT THE SPECIFIED RATE PER SUPPLIER.

REV. NO.	DATE	DRWN	CHKD	REMARKS
5	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
4	3/2023	JRH	NEJ	UPDATED FOR BIDDING
3	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE / DPW MATERIALS HANDLING AREA
2	11/2017	NEJ	ABM	REMOVED CULVERT PROTECTION IN RESPONSE TO COMMENTS FROM MASSDEP WETLANDS
1	3/2017	NEJ	MHL	REVISED TO RESPOND TO CONSERVATION COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY: E. SCHICK
DRAWN BY: E. SCHICK
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

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Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

WETLAND SOILS REMEDIATION PLAN (SHEET 2 OF 3)

PROJECT NO. 0235-113811
FILE NAME: C008-SRPL.DWG
SHEET NO. C-8

RECORD DRAWING

WETLAND RESTORATION PLANT SCHEDULE

SYMB.	COMMON NAME	LATIN NAME	CONTAINER	APP. HEIGHT	COMMENTS
AR	RED MAPLE	ACER RUBRUM	1.0–1.5" CALIPER		SPACE 15–FT OC
CA	SILKY DOGWOOD	CORNUS AMOMUM	#2	4'–5'	SPACE 10.5–FT OC
NS	BLACKGUM	NYSSA SYLVATICA	2.5–3.0" CALIPER		SPACE 15–FT OC
IV	WINTERBERRY	ILEX VERTICILLATA	#2	4'–5'	SPACE 10.5–FT OC
LB	SPICEBUSH	LONICERA BENZOIN	#2	4'–5'	SPACE 10.5–FT OC
VR	NORTHERN ARROWWOOD	VIBURNUM RECOGNITUM	#2	4'–5'	SPACE 10.5–FT OC
VC	HIGHBUSH BLUEBERRY	VACCINIUM CORYMBOSUM	#2	4'–5'	SPACE 10.5–FT OC

NOTES:
1. WETLAND RESTORATION – PLANT 194 TREES PER ACRE AT APPROX. 15 FT. ON CENTER IN A RANDOM PATTERN. PLANT 400 SHRUBS PER ACRE APPROX. 10.5 FT. ON CENTER IN A RANDOM PATTERN.
2. AFTER PLANTING TREES AND SHRUBS, SOW WITH NEW ENGLAND WETLAND PLANTS INC., NEW ENGLAND WETMIX, OR EQUAL, IN ACCORDANCE WITH SECTION 02955 AT THE SPECIFIED RATE PER SUPPLIER.

RECORD DRAWING

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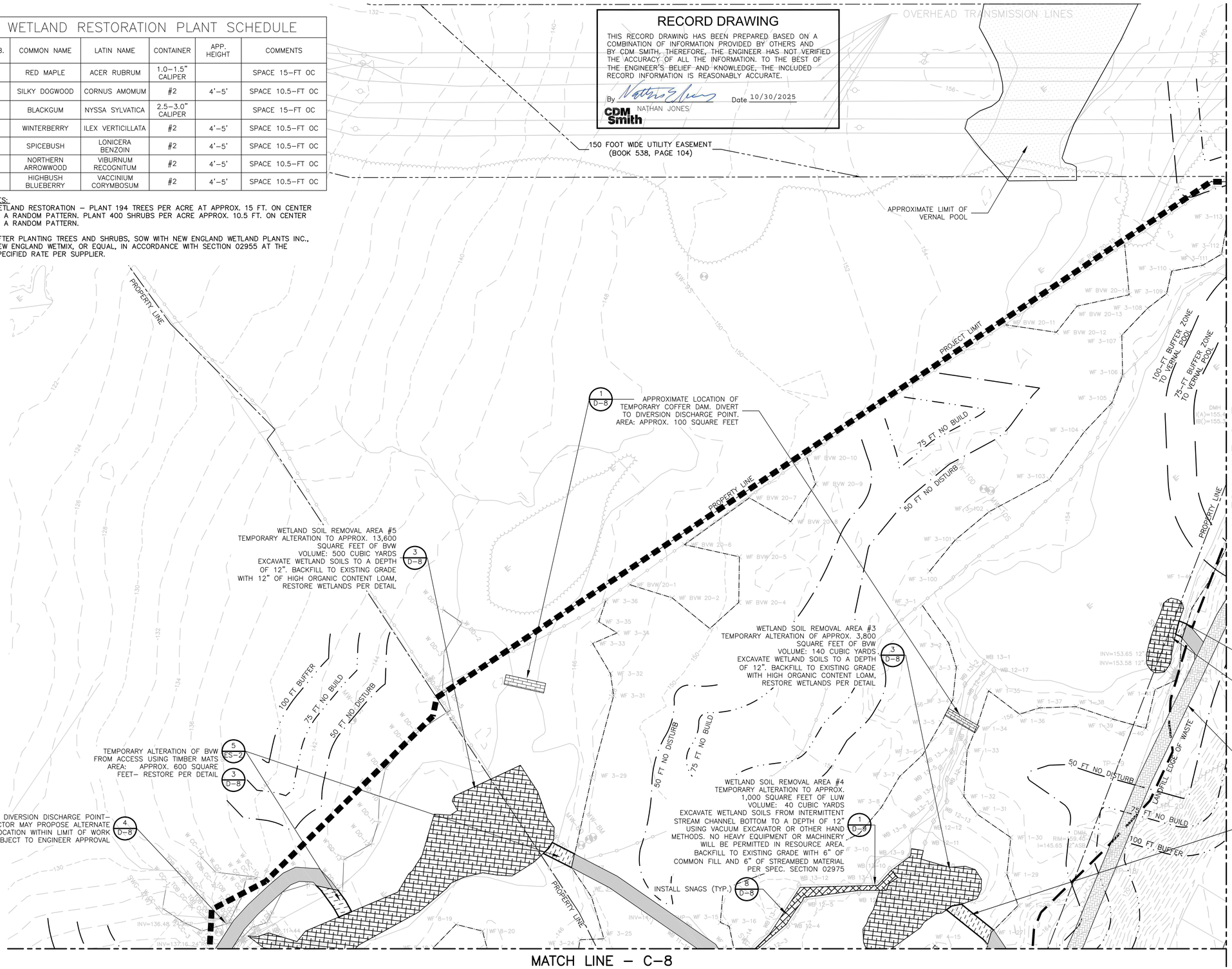
By NATHAN JONES Date 10/30/2025

CDM Smith


OVERHEAD TRANSMISSION LINES
150 FOOT WIDE UTILITY EASEMENT (BOOK 538, PAGE 104)
APPROXIMATE LIMIT OF VERNAL POOL
PROPERTY LINE
PROJECT LIMIT
APPROXIMATE LOCATION OF TEMPORARY COFFER DAM. DIVERT TO DIVERSION DISCHARGE POINT. AREA: APPROX. 100 SQUARE FEET
1 D–8
75 FT NO BUILD
50 FT NO DISTURB
100–FT BUFFER ZONE TO VERNAL POOL
75–FT BUFFER ZONE TO VERNAL POOL
WETLAND SOIL REMOVAL AREA #5
TEMPORARY ALTERATION TO APPROX. 13,600 SQUARE FEET OF BVW
VOLUME: 500 CUBIC YARDS
EXCAVATE WETLAND SOILS TO A DEPTH OF 12". BACKFILL TO EXISTING GRADE WITH 12" OF HIGH ORGANIC CONTENT LOAM, RESTORE WETLANDS PER DETAIL
3 D–8
100 FT BUFFER
75 FT NO BUILD
50 FT NO DISTURB
TEMPORARY ALTERATION OF BVW FROM ACCESS USING TIMBER MATS AREA: APPROX. 600 SQUARE FEET– RESTORE PER DETAIL
5 ES–2
3 D–8
DIVERSION DISCHARGE POINT– CONTRACTOR MAY PROPOSE ALTERNATE LOCATION WITHIN LIMIT OF WORK SUBJECT TO ENGINEER APPROVAL
4 D–8
WETLAND SOIL REMOVAL AREA #3
TEMPORARY ALTERATION OF APPROX. 3,800 SQUARE FEET OF BVW
VOLUME: 140 CUBIC YARDS
EXCAVATE WETLAND SOILS TO A DEPTH OF 12". BACKFILL TO EXISTING GRADE WITH HIGH ORGANIC CONTENT LOAM, RESTORE WETLANDS PER DETAIL
3 D–8
WETLAND SOIL REMOVAL AREA #4
TEMPORARY ALTERATION TO APPROX. 1,000 SQUARE FEET OF LUW
VOLUME: 40 CUBIC YARDS
EXCAVATE WETLAND SOILS FROM INTERMITTENT STREAM CHANNEL BOTTOM TO A DEPTH OF 12" USING VACUUM EXCAVATOR OR OTHER HAND METHODS. NO HEAVY EQUIPMENT OR MACHINERY WILL BE PERMITTED IN RESOURCE AREA. BACKFILL TO EXISTING GRADE WITH 6" OF COMMON FILL AND 6" OF STREAMBED MATERIAL PER SPEC. SECTION 02975
1 D–8
INSTALL SNAGS (TYP.)
8 D–8
50 FT NO DISTURB
75 FT NO BUILD
LANDFILL EDGE OF WASTE
100 FT BUFFER
5 ES–2
TEMPORARY ALTERATION OF BVW FROM ACCESS USING TIMBER MATS. AREA: APPROX. 500 SF– RESTORE PER DETAIL
3 D–8
WETLAND SOIL REMOVAL AREA #2
TEMPORARY ALTERATION TO APPROX. 900 SQUARE FEET OF BVW
VOLUME: 40 CUBIC YARDS
EXCAVATE WETLAND SOILS TO A DEPTH OF 12". BACKFILL TO EXISTING GRADE WITH 12" HIGH ORGANIC CONTENT LOAM. NO PLANTINGS OR SEEDING NECESSARY SINCE AREA NORMALLY INUNDATED
TEMPORARY ACCESS ROUTE FOR WETLAND SOILS REMOVAL IN UPLAND AREAS (TYP.)
MATCH LINE C–7
MATCH LINE – C–8
1" = 40'
20 0 40

PROPOSED LEGEND

- AREAS DESIGNATED FOR REMOVAL BASED ON ARSENIC CONCENTRATIONS
- UPLAND TEMPORARY ACCESS ROUTES TO WETLAND SOIL REMOVAL AREAS. CONTRACTOR TO IMPROVE ACCESS ROUTES AS REQUIRED IN ORDER TO PERFORM THE WORK. CONTRACTOR SHALL RESTORE DISTURBED AREAS OUTSIDE OF CAP LIMITS TO EXISTING CONDITIONS.
- ANTICIPATED TIMBER MAT ACCESS TO WETLAND SOIL REMOVAL AREAS. CONTRACTOR TO REMOVE AND RESTORE AREA TO EXISTING CONDITIONS FOLLOWING WETLAND SOIL REMOVAL
- APPROXIMATE LOCATION OF TEMPORARY COFFER DAM. CONTRACTOR MAY PROPOSE ALTERNATIVE LOCATIONS
- PROPOSED HAUL ROUTE TO TOP OF LANDFILL AND WETLAND SOILS DRYING / DISPOSAL AREA. CONTRACTOR MAY PROPOSE ALTERNATIVE ROUTES.

EXISTING LEGEND SEE SHEET G–2

NOTES:
1. WETLAND SOIL AREAS DESIGNATED FOR REMOVAL SHALL BE STAKED BY THE CONTRACTOR IN THE FIELD, AND APPROVED BY THE ENGINEER BEFORE REMOVAL.
2. ALL WETLAND SOILS REMOVED SHALL BE TRANSPORTED DIRECTLY TO THE LANDFILL IN VACUUM EXCAVATOR OR TRUCKS LINED WITH POLYETHYLENE SHEETING TO CONTAIN FREE LIQUIDS VIA ONSITE ROUTES AND SHALL BE DISPOSED UNDER THE LANDFILL CAP BEFORE LANDFILL CAP CONSTRUCTION.
3. WETLAND SOILS SHALL NOT BE TRANSPORTED ON PUBLIC ROADWAYS.
4. FINAL DISPOSAL OF WETLAND SOILS SHALL BE WITHIN THE DESIGNATED AREA AS SHOWN ON SHEET C–7.
5. NO HEAVY EQUIPMENT SHALL BE USED WITHIN WETLAND LIMITS OUTSIDE THE DESIGNATED REMOVAL AREAS AND ACCESS ROUTES.
6. MATERIALS USED FOR THE INSTALLATION OF COFFERDAMS AND TO CONSTRUCT TEMPORARY ACCESS ROUTES AND TIMBER MATS SHALL BE REMOVED FOLLOWING COMPLETION OF WETLAND RESTORATION.
7. WETLAND SOILS DRYING AREA TO BE LINED WITH A MINIMUM THICKNESS OF 20 MIL LINER AND BERMED (18–IN HIGH) ON ALL FOUR SIDES TO CONTAIN FREE LIQUIDS. WETLAND SOILS TO BE DISPOSED IN THE LANDFILL UNDER THE CAP PRIOR TO CAP CONSTRUCTION ONCE FREE LIQUIDS ARE NO LONGER PRESENT. ANY LIQUIDS THAT DO NOT EVAPORATE SHALL BE DRUMMED AND DISPOSED OFFSITE.
8. MAXIMUM THICKNESS OF DEPOSITED WETLAND SOILS AND RELOCATED WASTE UNDER THE CAP SHALL NOT EXCEED 12–INCHES.
9. NO CLEARING OUTSIDE CLEARING LIMITS FOR PROJECT SHALL BE PERMITTED WITH THE EXCEPTION OF THE DESIGNATED REMOVAL AREAS AND ACCESS ROUTES. TREES OUTSIDE CLEARING LIMITS AND DESIGNATED REMOVAL AREAS AND ACCESS ROUTES SHALL BE PROTECTED.
10. TO THE EXTENT POSSIBLE, PERFORM WETLAND SOILS REMOVAL DURING A DRY PERIOD.
11. ONCE WETLAND SOILS NO LONGER CONTAIN FREE LIQUIDS AS DETERMINED BY THE ENGINEER, PLACE IN DESIGNATED DISPOSAL AREA. PLACE MIN. 6–INCHES DAILY COVER OVER WETLAND SOILS AFTER PLACING IN DESIGNATED FINAL DISPOSAL AREA.

DEFINITIONS:
BVW – BORDERING VEGETATED WETLAND
LUW – LAND UNDER WATER

REV. NO.	DATE	DRWN	CHKD	REMARKS
4	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
3	3/2023	JRH	NEJ	UPDATED FOR BIDDING
2	11/2022	KAR	NEJ	REMOVED POST–CLOSURE USE / DPW MATERIALS HANDLING AREA
1	3/2017	NEJ	MHL	REVISED TO RESPOND TO CONSERVATION COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY: E. SCHICK
DRAWN BY: E. SCHICK
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

CDM Smith
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Boston, MA 02109
Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

WETLAND SOILS REMEDIATION PLAN (SHEET 3 OF 3)

PROJECT NO. 0235–113811
FILE NAME: C009–SRPL.DWG
SHEET NO. C–9

RECORD DRAWING

XREFs: [Wetland Survey.Dwg – WSP 9.2.15, FinaL Grading–Working, Full Site Survey Revised 5.11.16, C001GRPL, C06AEXMP, CDMS_2436, 20250827 andover sheet 2.subgrade, 20250915 ANDOVER. SHEET 4.FINAL GRADING] [Images: [] over sheet 3.liner, 20250827 ANDOVER. SHEET 1. CULVERT, 20250827 andover. sheet 2.subgrade, 20250915 ANDOVER. SHEET 4.FINAL GRADING]
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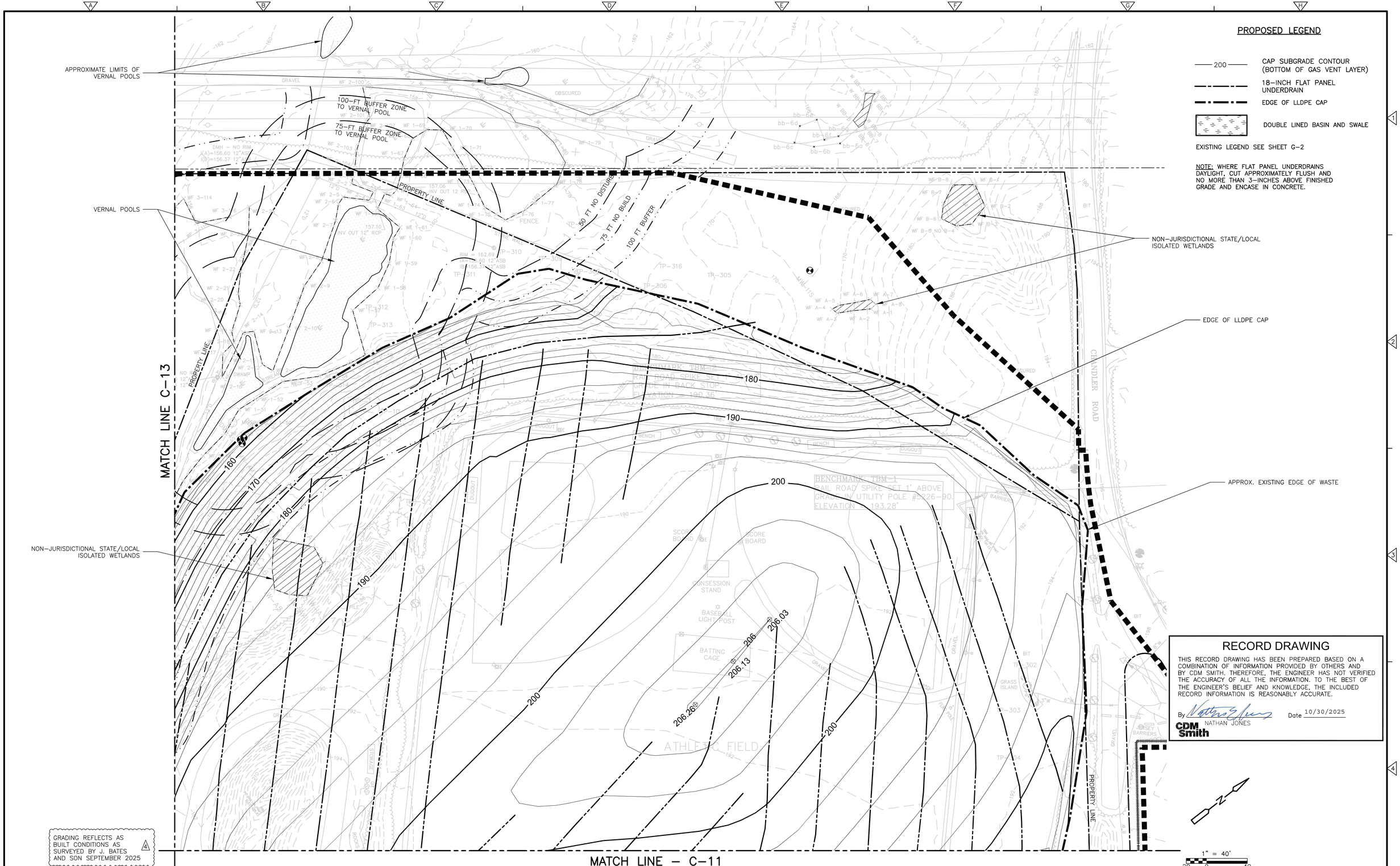
PROPOSED LEGEND
200 CAP SUBGRADE CONTOUR (BOTTOM OF GAS VENT LAYER)
18-INCH FLAT PANEL UNDERDRAIN
EDGE OF LLDPE CAP
DOUBLE LINED BASIN AND SWALE
EXISTING LEGEND SEE SHEET G-2
NOTE: WHERE FLAT PANEL UNDERDRAINS DAYLIGHT, CUT APPROXIMATELY FLUSH AND NO MORE THAN 3-INCHES ABOVE FINISHED GRADE AND ENCASE IN CONCRETE.
APPROXIMATE LIMITS OF VERNAL POOLS
VERNAL POOLS
100-FT BUFFER ZONE TO VERNAL POOL
75-FT BUFFER ZONE TO VERNAL POOL
PROPERTY LINE
50 FT NO DISTURB
75 FT NO BUILD
100 FT BUFFER
NON-JURISDICTIONAL STATE/LOCAL ISOLATED WETLANDS
EDGE OF LLDPE CAP
APPROX. EXISTING EDGE OF WASTE
MATCH LINE C-13
MATCH LINE - C-11
BENCHMARK: TBM-1
RAIL ROAD SPIKE SET 1' ABOVE GRADE IN UTILITY POLE #3226-90.
ELEVATION = 193.28'
BENCHMARK: TBM-2
RAIL ROAD SPIKE SET 1' ABOVE GRADE IN BACK STOP.
ELEVATION = 190.36
CHANDLER ROAD
ATHLETIC FIELD
GRADING REFLECTS AS BUILT CONDITIONS AS SURVEYED BY J. BATES AND SON SEPTEMBER 2025
4
1" = 40'
20 0 40

RECORD DRAWING

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By Nathan E. Jones Date 10/30/2025
NATHAN JONES
CDM Smith

REV. NO.	DATE	DRWN	CHKD	REMARKS
4	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
3	3/2023	JRH	NEJ	UPDATED FOR BIDDING
2	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE / DPW MATERIALS HANDLING AREA
1	1/2018	JRH	NEJ	REVISED TO RESPOND TO MASSDEP 12/14/2017 NOTICE OF TECHNICAL DEFICIENCY

DESIGNED BY: N. JONES
DRAWN BY: N. JONES
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

CDM Smith
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Boston, MA 02109
Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

CAPPING PLAN (SHEET 1 OF 4)

PROJECT NO. 0235-113811
FILE NAME: C010SGPLRD.DWG
SHEET NO. C-10

RECORD DRAWING

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MATCH LINE – C–10

MATCH LINE C–12

PROPOSED LEGEND

- 200 — CAP SUBGRADE CONTOUR (BOTTOM OF GAS VENT LAYER)
- 18–INCH FLAT PANEL UNDERDRAIN
- EDGE OF LLDPE CAP
- DOUBLE LINED WETLAND
- DOUBLE LINED SWALE

EXISTING LEGEND SEE SHEET G–2

NOTE: WHERE FLAT PANEL UNDERDRAINS DAYLIGHT, CUT APPROXIMATELY FLUSH AND NO MORE THAN 3–INCHES ABOVE FINISHED GRADE AND ENCASE IN CONCRETE.

DAYLIGHT TO DRAINAGE SWALE (TYP.)

3 / D–3 DOUBLE LINED WETLAND

APPROX. EXISTING EDGE OF WASTE

NON–JURISDICTIONAL STATE/LOCAL ISOLATED WETLANDS

2 / D–3 DOUBLE LINED SWALE

GRADING REFLECTS AS BUILT CONDITIONS AS SURVEYED BY J. BATES AND SON SEPTEMBER 2025 (5)

BENCHMARK: TBM–3
LARGE MAG NAIL SET IN BASE OF 24" OAK TREE
ELEVATION = 175.51'

BENCHMARK: TBM–6
RAIL ROAD SPIKE SET IN BASE OF UTILITY POLE #4760.
ELEVATION = 172.55'

RECORD DRAWING

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By _____ Date 10/30/2025
NATHAN JONES
CDM Smith

1" = 40'
20 0 40

REV. NO.	DATE	DRWN	CHKD	REMARKS
5	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
4	3/2023	JRH	NEJ	UPDATED FOR BIDDING
3	11/2022	KAR	NEJ	REMOVED POST–CLOSURE USE / DPW MATERIALS HANDLING AREA
2	1/2018	JRH	NEJ	REVISED TO RESPOND TO MASSDEP 12/14/2017 NOTICE OF TECHNICAL DEFICIENCY
1	4/2017	NEJ	DJG	CORRECTED DETAIL REFERENCE

DESIGNED BY: N. JONES
DRAWN BY: N. JONES
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

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TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

CAPPING PLAN (SHEET 2 OF 4)

PROJECT NO. 0235–113811
FILE NAME: C011SGPLRD.DWG
SHEET NO. C-11

RECORD DRAWING

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MATCH LINE – C–13

MATCH LINE C–11

PROPOSED LEGEND

- 200 — CAP SUBGRADE CONTOUR (BOTTOM OF GAS VENT LAYER)
- 18–INCH FLAT PANEL UNDERDRAIN
- EDGE OF LLDPE CAP
- DOUBLE LINED BASIN AND SWALE

EXISTING LEGEND SEE SHEET G–2

NOTE: WHERE FLAT PANEL UNDERDRAINS DAYLIGHT, CUT APPROXIMATELY FLUSH AND NO MORE THAN 3–INCHES ABOVE FINISHED GRADE AND ENCASE IN CONCRETE.

18" UNDERDRAIN (TYP.)

APPROX. EXISTING EDGE OF WASTE

2 / D–3 DOUBLE LINED BASIN

NON–JURISDICTIONAL STATE/LOCAL ISOLATED WETLANDS

65' (TYP.)

50 FOOT WIDE DRAIN EASEMENT (BOOK 1191, PAGE 656)

50 FT NO DISTURB

75 FT NO BUILD

100 FT BUFFER

EDGE OF LLDPE CAP

EXISTING EDGE OF WASTE

PROPERTY LINE

BENCHMARK: TBM–5
RAIL ROAD SPIKE SET IN BASE OF 18" PINE TREE.
ELEVATION = 154.32'

BENCHMARK: TBM–4
RAIL ROAD SPIKE SET IN BASE OF 14" OAK TREE.
ELEVATION = 162.54'

GRADING REFLECTS AS BUILT CONDITIONS AS SURVEYED BY J. BATES AND SON SEPTEMBER 2025

RECORD DRAWING

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By _____ NATHAN JONES Date 10/30/2025

CDM Smith

1" = 40'
20 0 40

REV. NO.	DATE	DRWN	CHKD	REMARKS
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DESIGNED BY: N. JONES
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SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

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TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

CAPPING PLAN (SHEET 3 OF 4)

PROJECT NO. 0235–113811
FILE NAME: C012SGPLRD.DWG
SHEET NO. C-12

RECORD DRAWING

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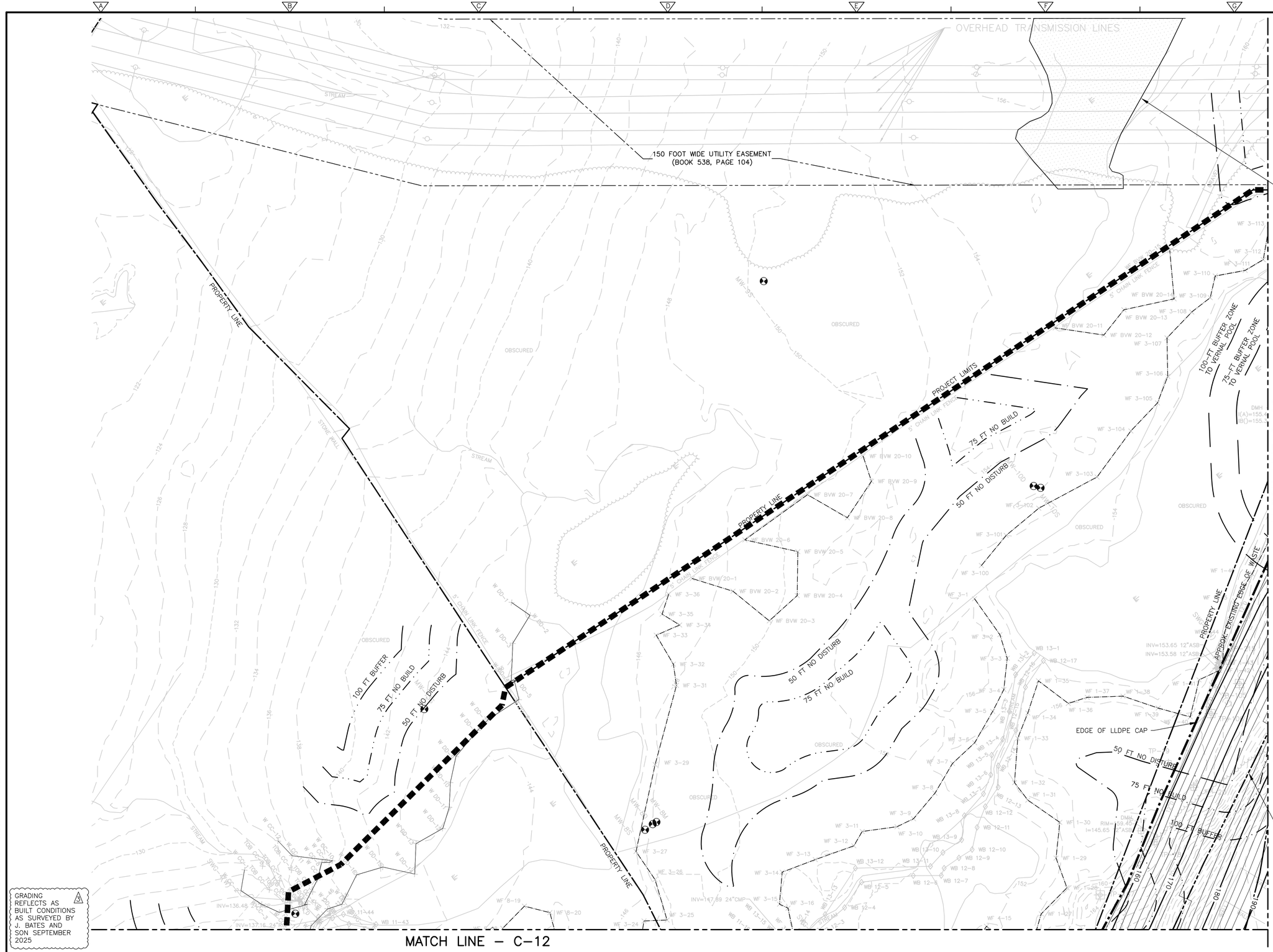

PROPOSED LEGEND

- 200 — CAP SUBGRADE CONTOUR (BOTTOM OF GAS VENT LAYER)
- 18-INCH FLAT PANEL UNDERDRAIN
- EDGE OF LLDPE CAP
- DOUBLE LINED BASIN AND SWALE

EXISTING LEGEND SEE SHEET G-2

GRADING REFLECTS AS BUILT CONDITIONS AS SURVEYED BY J. BATES AND SON SEPTEMBER 2025 (3)

1" = 40'
20 0 40

RECORD DRAWING

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By _____ Date 10/30/2025
NATHAN JONES
CDM Smith

REV. NO.	DATE	DRWN	CHKD	REMARKS
3	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
2	3/2023	JRH	NEJ	UPDATED FOR BIDDING
1	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE / DPW MATERIALS HANDLING AREA

DESIGNED BY: N. JONES
DRAWN BY: N. JONES
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

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TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

CAPPING PLAN (SHEET 4 OF 4)

PROJECT NO. 0235-113811
FILE NAME: C013SGPLRD.DWG
SHEET NO. C-13

RECORD DRAWING

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APPROXIMATE LIMITS OF VERNAL POOL #4

APPROXIMATE LIMITS OF VERNAL POOL #5

FLARED END SECTION (2/D-5)
△4 INV = 166.22

PLACE 12" LAYER HIGH ORGANIC CONTENT LOAM OVER EXPOSED SECTIONS OF PIPE – RESTORE BVW BANK PER DETAIL (6/ES-2)

VERNAL POOL #1

PERMANENT ALTERATION TO BVW AREA: 540 SQUARE FEET

VERNAL POOL #2

GRASS STORMWATER SWALE (TYP.) SLOPE APPROX. 1% (1/D-3)

MATCH LINE C-17

NON-JURISDICTIONAL STATE/LOCAL ISOLATED WETLANDS

GRADING AND LIMITS OF RIPRAP REFLECT AS BUILT CONDITIONS AS SURVEYED BY J. BATES AND SON SEPTEMBER 2025 △4

MATCH LINE – C-15

100-FT BUFFER ZONE TO VERNAL POOL

75-FT BUFFER ZONE TO VERNAL POOL

50 FT NO DISTURB

75 FT NO BUILD

100 FT BUFFER

50 FT NO DISTURB

75 FT NO BUILD

100 FT BUFFER

PROJECT LIMITS

PROPERTY LINE

EDGE OF CAP

BENCHMARK: TBM-1
RAIL ROAD SPIKE SET 1' ABOVE GRADE IN BACK SIDE OF UTILITY POLE #522-90
ELEVATION = 193.28'

(2/D-4) SPILLWAY (WIDTH VARIES) ARTICULATED BLOCK CONCRETE MAT ON ROADWAY, RIPRAP, (STONER FOR PIPE ENDS) ON SIDE SLOPES

(3/D-5) OUTLET CONTROL STRUCTURE

(1/D-6) CHECK DAM AT FOREBAY

NON-JURISDICTIONAL STATE/LOCAL ISOLATED WETLANDS

REVISED TREELINE (TYP.)

NORTH STORMWATER BASIN

(1/D-4) RIPRAP PAD

(4/D-2) RIPRAP TOE DRAIN

RECORD DRAWING

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By _____ Date 10/30/2025
NATHAN JONES
CDM Smith

PROPOSED LEGEND

- RIPRAP
- ARTICULATED CONCRETE BLOCK
- 167.57 FINAL SPOT ELEVATION
- 188 FINAL CONTOUR
- PROJECT LIMITS
- EDGE OF LANDFILL CAP

1" = 40'
20 0 40

REV. NO.	DATE	DRWN	CHKD	REMARKS
4	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
3	3/2023	JRH	NEJ	UPDATED FOR BIDDING
2	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE / DPW MATERIALS HANDLING AREA
1	4/2017	JRH	NEJ	REVISED TO RESPOND TO CONSERVATON COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY: G. HOWARD
DRAWN BY: J. HEIL
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

CDM Smith
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TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

FINAL GRADING AND DRAINAGE PLAN (SHEET 1 OF 4)

PROJECT NO. 0235-113811
FILE NAME: C014GDPLRD.DWG

SHEET NO.
C-14

RECORD DRAWING

XREFs: [Wetland Survey Dwg - WSP 9.2.15, FinaL Grading-Working, Full Site Survey Revised 5.11.16, C001GRPL, 16365-CS-BN, CDMS_2436, 20250827 andover sheet 3.liner, 20250827 ANDOVER. SHEET 1. CULVERT, 20250827 andover. sheet 2.subgrade, 20250915 ANDOVER. SHEET 4.FINAL GRADING] Images: []
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MATCH LINE – C–14

MATCH LINE C–16

REVISED TREELINE (TYP.)

3/D–3 DOUBLE LINED WETLAND BASIN– SEE SHEET C–11 FOR LIMITS

4/D–2 RIPRAP TOE DRAIN

PERMANENT ALTERATION TO IWW/ILSF AREA: 22,300 SQUARE FEET

NON–JURISDICTIONAL STATE/LOCAL ISOLATED WETLANDS

2/D–3 SOUTHERN BASIN AND ACCESS DRIVE

GRADING AND LIMITS OF RIPRAP REFLECT AS BUILT CONDITIONS AS SURVEYED BY J. BATES AND SON SEPTEMBER 2025 (4)

BENCHMARK: TBM–3
LARGE MAG NAIL SET IN BASE OF 24" OAK TREE
ELEVATION = 175.51'

BENCHMARK: TBM–6
RAIL ROAD SPIKE SET IN BASE OF UTILITY POLE #4760
ELEVATION = 172.55'

RECORD DRAWING

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By _____ Date 10/30/2025
NATHAN JONES
CDM Smith

PROPOSED LEGEND

- RIPRAP
- WETLAND IMPACT AREAS
- ⊕167.57 FINAL SPOT ELEVATION
- 188 FINAL CONTOUR
- PROJECT LIMITS
- EDGE OF LANDFILL CAP

NOTE: FOR EXISTING CONDITIONS NOTES AND LEGEND, SEE SHEET G–2.

1" = 40'
20 0 40

REV. NO.	DATE	DRWN	CHKD	REMARKS
4	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
3	3/2023	JRH	NEJ	UPDATED FOR BIDDING
2	11/2022	KAR	NEJ	REMOVED POST–CLOSURE USE / DPW MATERIALS HANDLING AREA
1	4/2017	JRH	NEJ	REVISED TO RESPOND TO CONSERVATON COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY: G. HOWARD
DRAWN BY: J. HEIL
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

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TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

FINAL GRADING AND DRAINAGE PLAN (SHEET 2 OF 4)

PROJECT NO. 0235–113811
FILE NAME: C015GDPLRD.DWG
SHEET NO. C-15

RECORD DRAWING

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MATCH LINE – C–17

MATCH LINE C–15

PROPOSED LEGEND

- WETLAND IMPACT AREAS
- RIPRAP
- ARTICULATED CONCRETE BLOCK
- WETLAND REPLICATION AREA
- 167.57 FINAL SPOT ELEVATION
- 188 FINAL CONTOUR
- PROJECT LIMITS
- EDGE OF LANDFILL CAP

NOTE: FOR EXISTING CONDITIONS NOTES AND LEGEND, SEE SHEET G–2.

WETLAND REPLICATION AREA (1/D–9)

4/D–2 RIPRAP TOE DRAIN

PERMANENT ALTERATION TO BVW, LUW AND BANK
BVW AREA: 1,250 SQUARE FEET
LUW AREA: 3,450 SQUARE FEET
BANK IMPACTS: 190 LINEAR FEET

2/D–6 HDPE FLARED END SECTION
INV. = 157.99 (A)

4/D–3 DETENTION DRAIN

PERMANENT ALTERATION TO BANK: 48 LF

1/D–3 GRASS STORMWATER SWALE (TYP.) SLOPE APPROX. 1%

REVISED TREELINE (TYP.)

2/D–3 DOUBLE LINED BASIN– SEE SHEET C–12 FOR LIMITS

NON–JURISDICTIONAL STATE/LOCAL ISOLATED WETLANDS

2/D–4 SPILLWAY (WIDTH VARIES) ARTICULATED BLOCK CONCRETE MAT ON ROADWAY, RIPRAP (STONER FOR PIPE ENDS) ON OUTER SLOPE, MODIFIED ROCKFILL (DMAX = 8–IN) ON INNER SLOPE

1/D–6 CHECK DAM AT FOREBAY

3/D–6 OUTLET CONTROL STRUCTURE

EXTEND PIPE ONTO LANDFILL PROPERTY AND INSTALL RCP FLARED END SECTION (SEE SHEET C–29)

BENCHMARK: PBM–5
RAIL ROAD SPIKE SET IN BASE OF 18" PINE TREE.
ELEVATION = 164.32'

BENCHMARK: TBM–4
BASE OF 14" OAK TREE.
ELEVATION = 162.54'

100 FT BUFFER
75 FT NO BUILD
50 FT NO DISTURB

PROPERTY LINE
PROJECT LIMITS
EDGE OF CMP
50 FOOT WIDE DRAIN EASEMENT (BOOK 1191, PAGE 656)
PETTINGELL AVENUE

GRADING AND LIMITS OF RIPRAP REFLECT AS BUILT CONDITIONS AS SURVEYED BY J. BATES AND SON SEPTEMBER 2025

RECORD DRAWING

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By _____ NATHAN JONES Date 10/30/2025

CDM Smith

1" = 40'
20 0 40

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4	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
3	3/2023	JRH	NEJ	UPDATED FOR BIDDING
2	11/2022	KAR	NEJ	REMOVED POST–CLOSURE USE / DPW MATERIALS HANDLING AREA
1	3/2017	NEJ	MHL	REVISED TO RESPOND TO CONSERVATION COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY: G. HOWARD
DRAWN BY: J. HEIL
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

CDM Smith
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Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

FINAL GRADING AND DRAINAGE PLAN (SHEET 3 OF 4)

PROJECT NO. 0235–113811
FILE NAME: C016GDPLRD.DWG
SHEET NO. C-16

RECORD DRAWING

XREFs: [CDM_2436_Wetland Survey Dwg - WSP 9.2.15_Final_Grading-Working, Full Site Survey Revised 5.11.16, C001GRPL, CDM5_2436, 20250827 andover sheet 3.liner, 20250827 ANDOVER. SHEET 1. CULVERT, 20250827 andover. sheet 2.subgrade, 20250915 ANDOVER. SHEET 4.FINAL GRADING] Images: []
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OVERHEAD TRANSMISSION LINES

APPROXIMATE LIMIT OF VERNAL POOL #5

150 FOOT WIDE UTILITY EASEMENT (BOOK 538, PAGE 104)

PROPERTY LINE

STREAM

STONE WALL

OBSCURED

MW-95

PLACE 12" LAYER HIGH ORGANIC CONTENT LOAM OVER EXPOSED SECTIONS OF PIPE – RESTORE BVW BANK PER DETAIL 6 / ES-2

PROJECT LIMITS

5' CHAIN LINK FENCE

75 FT NO BUILD

50 FT NO DISTURB

100 FT BUFFER

75 FT BUFFER ZONE TO VERNAL POOL

100-FT BUFFER ZONE TO VERNAL POOL

WETLAND FLAG SERIES 3

TOP OF BANK SERIES 13

WETLAND FLAG SERIES 13

EDGE OF CAP

TOE

DMH (IA)=155 (BO)=155

INV=153.58 12" HDPE

INV=153.58 12" HDPE

INV=147.69 24"CMP

INV=136.45 24"CMP

INV=137.16 24"CMP

MATCH LINE C-14

MATCH LINE – C-16

PERMANENT ALTERATION BVW AREA: 1,350 SQUARE FEET

FINAL TREELINE (TYP.)

1 / D-3 GRASS STORMWATER SWALE (TYP.) SLOPE APPROX. 1%

4 / D-2 RIPRAP TOE DRAIN

PROPOSED LEGEND

- WETLAND IMPACT AREAS
- ⊕167.57 FINAL SPOT ELEVATION
- 188 FINAL CONTOUR
- PROJECT LIMITS
- EDGE OF LANDFILL CAP
- RIPRAP

NOTE: FOR EXISTING CONDITIONS NOTES AND LEGEND, SEE SHEET G-2.

GRADING AND LIMITS OF RIPRAP REFLECT 4 AS BUILT CONDITIONS AS SURVEYED BY J. BATES AND SON SEPTEMBER 2025

RECORD DRAWING

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By NATHAN JONES Date 10/30/2025

CDM Smith

1" = 40'
20 0 40

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2	3/2023	JRH	NEJ	UPDATED FOR BIDDING
1	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE / DPW MATERIALS HANDLING AREA

DESIGNED BY: G. HOWARD
DRAWN BY: J. HEIL
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CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

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TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

FINAL GRADING AND DRAINAGE PLAN (SHEET 4 OF 4)

PROJECT NO. 0235-113811
FILE NAME: C017GDPLRD.DWG
SHEET NO. C-17

RECORD DRAWING

XREFs: [Wetland Survey Dwg - WSP 9.2.15, Final_Grading-Working, Full Site Survey Revised 5.11.16, C001GRPL, CDMS_2436, 20250827 andover sheet 3.liner, 20250827 ANDOVER. SHEET 1. CULVERT, 20250827 andover. sheet 2.subgrade, 20250915 ANDOVER. SHEET 4.FINAL GRADING] Images: []
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APPROXIMATE LIMITS OF VERNAL POOL #4

APPROXIMATE LIMITS OF VERNAL POOL #3

VERNAL POOL #1

VERNAL POOL #2

NON-JURISDICTIONAL STATE/LOCAL ISOLATED WETLANDS

MATCH LINE C-21

MATCH LINE – C-19

100-FT BUFFER ZONE TO VERNAL POOL

75-FT BUFFER ZONE TO VERNAL POOL

POTENTIAL FUTURE WALKING PATH

5 / D-8 DELINEATOR POSTS AS SPECIFIED (TYP. OF 10)

bb-6a, bb-6b, bb-6c, bb-6d, bb-6e, bb-6f, bb-6g

PROPERTY LINE

50 FT. NO DISTURB

15 FT. NO BUILD

100 FT. BUFFER

EDGE OF CAP

PROJECT LIMITS

NON-JURISDICTIONAL STATE/LOCAL ISOLATED WETLANDS

FINAL TREELINE (TYP.)

3 / D-1 12-FT WIDE GRAVEL ACCESS DRIVE 4

LIMIT OF POTENTIAL FUTURE WALKING PATH

POTENTIAL FUTURE WALKING PATH

BENCHMARK: TBM-1
RAIL ROAD SPIKE SET 1' ABOVE GRADE IN BACK STOP
ELEVATION = 190.36'

BENCHMARK: TBM-2
RAIL ROAD SPIKE SET 4' ABOVE GRADE IN UTILITY POLE #522-90
ELEVATION = 193.28'

CHANDLER ROAD

ATHLETIC FIELD

SCORE BOARD

CONCESSION STAND

BASEBALL LIGHT POST

BATTING CAGE

PROPOSED LEGEND

- EVERGREEN TREE
- DECIDUOUS TREE
- FINAL TREELINE
- POTENTIAL FUTURE WALKING PATH
- PROJECT LIMITS
- EDGE OF LANDFILL CAP

NOTES:
1. FOR EXISTING CONDITIONS NOTES AND LEGEND, SEE SHEET G-2.
2. FOR PLANT SCHEDULE, SEE DETAIL 2 / D-8

RECORD DRAWING

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By NATHAN JONES Date 10/30/2025

CDM Smith

1" = 40'
20 0 40

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APPROVED BY: N. JONES
DATE: OCTOBER 2025

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TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

LAYOUT AND MATERIALS PLAN (SHEET 1 OF 4)

PROJECT NO. 0235-113811
FILE NAME: C018LMPLRD.DWG

SHEET NO.
C-18

RECORD DRAWING

XREFs: [Wetland Survey Dwg - WSP 9.2.15, FinaL Grading-Working, Full Site Survey Revised 5.11.16, C001GRPL, 16365-CS-BN, CDMS_2436, 20250827 andover sheet 3.liner, 20250827 ANDOVER. SHEET 1. CULVERT, 20250827 andover. sheet 2.subgrade, 20250915 ANDOVER. SHEET 4.FINAL GRADING] Images: []
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MATCH LINE – C-18

MATCH LINE C-20

PROPOSED LEGEND

- EVERGREEN TREE
- DECIDUOUS TREE
- FINAL TREELINE
- POTENTIAL FUTURE WALKING PATH
- PROJECT LIMITS
- EDGE OF LANDFILL CAP

NOTES:
1. FOR EXISTING CONDITIONS NOTES AND LEGEND, SEE SHEET G-2.
2. FOR PLANT SCHEDULE, SEE DETAIL 2/D-8

POTENTIAL FUTURE WALKING PATH

FINAL TREELINE (TYP.)

NON-JURISDICTIONAL STATE/LOCAL ISOLATED WETLANDS

12-FT WIDE GRAVEL ACCESS DRIVE (2/D-3)

RELOCATED ENTRY GATE FROM LEDGE ROAD, SEE SHEET C-1

4/D-1 3 - QR

5/D-1 3 - PS

4/D-1 4 - PS

4/D-1 1 - QR

BENCHMARK: TBM-3
RAILROAD MAG NAIL SET IN BASE OF 24" OAK TREE.
ELEVATION = 175.51'

BENCHMARK: TBM-6
RAIL ROAD SPIKE SET IN BASE OF UTILITY POLE #4760.
ELEVATION = 172.55'

GREENWOOD ROAD

RIPRAP (TYP.)

100 FT. BUFFER

75 FT. NO BUILD

60 FT. NO DISTURB

PROPERTY LINE

PROJECT LIMITS

EDGE OF CAP

RECORD DRAWING

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By NATHAN JONES Date 10/30/2025

CDM Smith

1" = 40'
20 0 40

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DESIGNED BY: G. HOWARD
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TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

LAYOUT AND MATERIALS PLAN (SHEET 2 OF 4)

PROJECT NO. 0235-113811
FILE NAME: C019LMPLRD.DWG
SHEET NO. C-19

RECORD DRAWING

XREFs: [Wetland Survey Dwg – WSP 9.2.15, Final_Grading-Working, Full Site Survey Revised 5.11.16, C001GRPL, 16365-CS-BN, CDMS_2436, 20250827 andover sheet 3.liner, 20250827 ANDOVER. SHEET 1. CULVERT, 20250827 andover. sheet 2.subgrade, 20250915 ANDOVER. SHEET 4.FINAL GRADING] Images: []
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MATCH LINE – C-21

MATCH LINE C-19

WETLAND REPLICATION AREA (1/D-9)

POTENTIAL FUTURE WALKING PATH

FINAL TREELINE (TYP.)

100 FT BUFFER

75 FT NO BUILD

50 FT NO DISTURB

PROJECT LIMITS

PROPERTY LINE

50 FT NO DISTURB

NO BUILD

GRAVEL ACCESS ROAD (TYP.)

BENCHMARK: PBM-5
RAIL ROAD SPIKE SET IN
BASE OF 18" PINE TREE.
ELEVATION = 154.32'

BENCHMARK: TBM-4
RAIL ROAD SPIKE SET IN
BASE OF 14" OAK TREE.
ELEVATION = 162.54'

INV=148.12 24"CMP

INV=145.53 12"CI

INV=146.00 12"CI

INV=144.78 15"RCP

3 – QR (4/D-1)

2 – SN (7/D-1)

INVERT = 157.99 FES

INVERT = 168.74 DICKEY STRUCTURE

INVERT = 168.85 DICKEY STRUCTURE

12" DIA HDPE PIPE

EDGE OF CAP

50 FOOT WIDE DRAIN EASEMENT
(BOOK 1191, PAGE 656)

LIMIT OF POTENTIAL FUTURE WALKING PATH

PETTINGELL AVENUE

DMH
RIM=154.65
I(A)=150.90
I(B)=150.90

CB
RIM=163.37
I(A)=159.17
I(B)=159.17

#5 #6 #7 #170

PROPOSED LEGEND

- EVERGREEN TREE
- DECIDUOUS TREE
- WETLAND REPLICATION AREA
- FINAL TREELINE
- POTENTIAL FUTURE WALKING PATH
- PROJECT LIMITS
- EDGE OF LANDFILL CAP

NOTES:
1. FOR EXISTING CONDITIONS NOTES AND LEGEND, SEE SHEET G-2.
2. FOR PLANT SCHEDULE, SEE DETAIL (2/D-8)

(3/D-1) OFF CAP 12-FT WIDE GRAVEL ACCESS DRIVE

NON-JURISDICTIONAL STATE/LOCAL ISOLATED WETLANDS

(5/D-8) DELINEATOR POSTS AS SPECIFIED (TYP. OF 11)

(5/D-1) 3-PS

(2/D-3) 12-FT WIDE GRAVEL ACCESS DRIVE

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By Nathan E. Jones Date 10/30/2025

CDM Smith NATHAN JONES

1" = 40'
20 0 40

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DESIGNED BY: G. HOWARD
DRAWN BY: J. HEIL
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

CDM Smith
75 State Street, Suite 701
Boston, MA 02109
Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

LAYOUT AND MATERIALS PLAN (SHEET 3 OF 4)

PROJECT NO. 0235-113811
FILE NAME: C020LMPLRD.DWG
SHEET NO. C-20

RECORD DRAWING

XREFs: [CDM_2436, Wetland Survey Dwg – WSP 9.2.15, Full Site Survey Revised 5.11.16, CDMS_2436, 20250827 andover sheet 3.liner, 20250827 ANDOVER. SHEET 1. CULVERT, 20250827 andover. sheet 2.subgrade, 20250915 ANDOVER. SHEET 4.FINAL GRADING] Images: []
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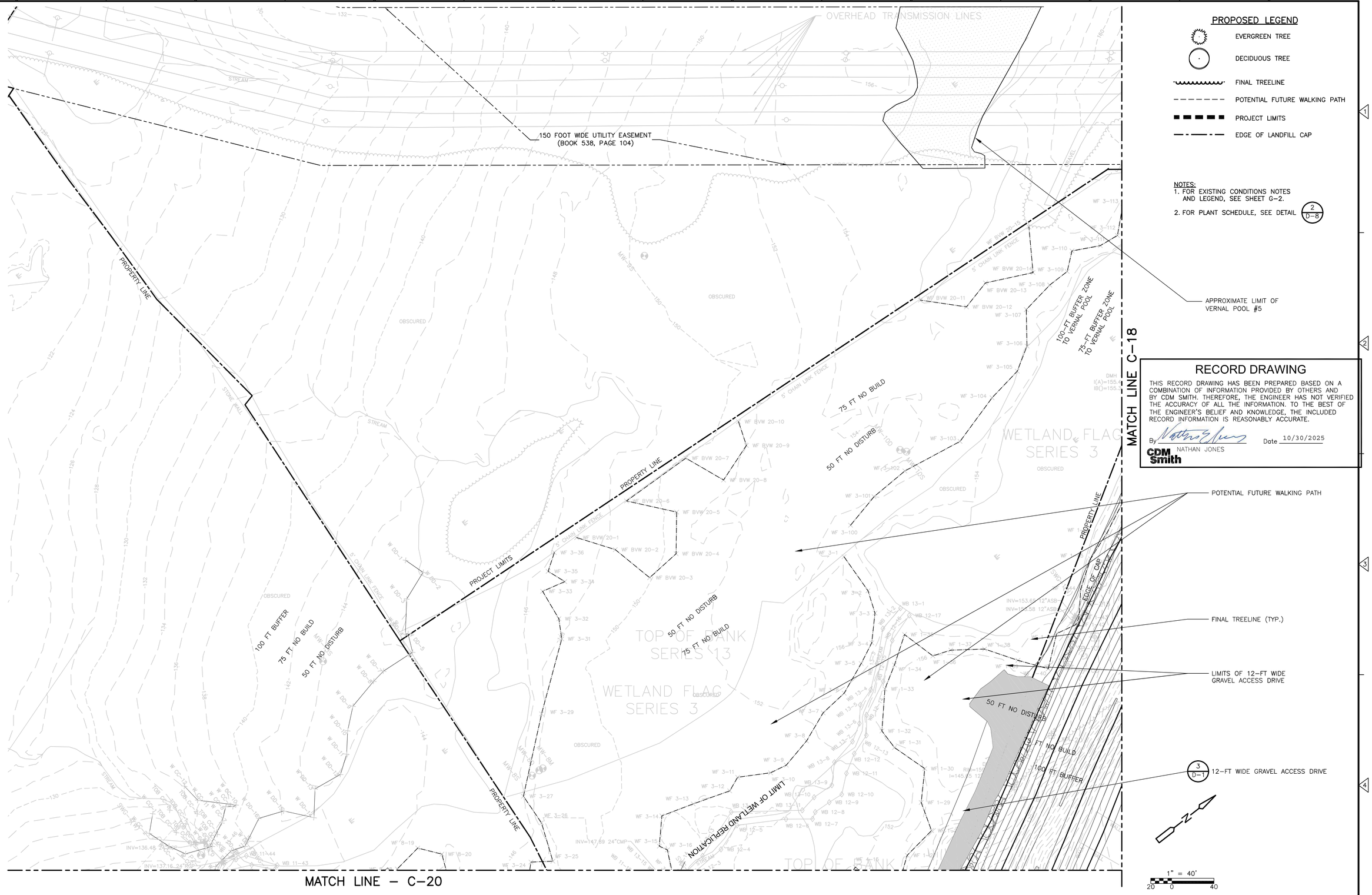

PROPOSED LEGEND

- EVERGREEN TREE
- DECIDUOUS TREE
- FINAL TREELINE
- POTENTIAL FUTURE WALKING PATH
- PROJECT LIMITS
- EDGE OF LANDFILL CAP

NOTES:
1. FOR EXISTING CONDITIONS NOTES AND LEGEND, SEE SHEET G-2.
2. FOR PLANT SCHEDULE, SEE DETAIL 2/D-8

RECORD DRAWING

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By _____ Date 10/30/2025
NATHAN JONES
CDM Smith

REV. NO.	DATE	DRWN	CHKD	REMARKS
3	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
2	3/2023	JRH	NEJ	UPDATED FOR BIDDING
1	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE / DPW MATERIALS HANDLING AREA

DESIGNED BY: G. HOWARD
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APPROVED BY: N. JONES
DATE: OCTOBER 2025

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TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

LAYOUT AND MATERIALS PLAN (SHEET 4 OF 4)

PROJECT NO. 0235-113811
FILE NAME: C021LMPLRD.DWG
SHEET NO.
C-21

RECORD DRAWING

XREFs: [Wetland Survey Dwg - WSP 9.2.15, Final_Grading-Working, Full Site Survey Revised 5.11.16, C001GRPL, 16365-CS-BN, CDMS_2436, 20250827 andover sheet 3.liner, 20250827 ANDOVER, SHEET 1. CULVERT, 20250827 andover, SHEET 2. SUBGRADE, 20250915 ANDOVER, SHEET 4.FINAL GRADING] Images: []
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PROPOSED LEGEND

- PROPOSED PASSIVE GAS VENT
- PROPOSED HORIZONTAL GAS COLLECTION TRENCH
- PROPOSED LANDFILL GAS MONITORING WELL
- PROPOSED GROUNDWATER MONITORING WELL

NOTES:
1. FOR EXISTING CONDITIONS NOTES AND LEGEND, SEE SHEET G-2.
2. PROPOSED MONITORING WELL LOCATIONS SHALL BE STAKED BY CONTRACTOR FOR VERIFICATION BY ENGINEER.

SHEET 1 OF 3

SHEET 2 OF 3

SHEET 3 OF 3

SHEET MATCH LINE
SHEET MATCH LINE

150 FOOT WIDE UTILITY EASEMENT (BOOK 536, PAGE 104)

50 FOOT WIDE DRAIN EASEMENT (BOOK 1191, PAGE 606)

CHANDLER ROAD

GREENWOOD ROAD

PETTINGILL ROAD

WETLAND FLAG SERIES 3

WETLAND FLAG SERIES 5

WETLAND FLAG SERIES 8

WETLAND FLAG SERIES 9

TOP OF BANK SERIES 13

TOP OF BANK SERIES 8

TOP OF BANK SERIES 9

ATHLETIC FIELD

RECORD DRAWING

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By _____ Date 10/30/2025
NATHAN JONES
CDM Smith

1" = 80'
40 0 80

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5	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
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2	1/2018	NEJ	ABM	REVISED TO RESPOND TO MASSDEP 12/14/2017 NOTICE OF TECHNICAL DEFICIENCY
1	4/2017	JRH	NEJ	REVISED TO RESPOND TO CONSERVATON COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY: E. SCHICK
DRAWN BY: E. SCHICK
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

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TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

ENVIRONMENTAL MONITORING NETWORK AND LANDFILL GAS MANAGEMENT SYSTEM KEY PLAN

PROJECT NO. 0235-113811
FILE NAME: C022-GVPL.DWG
SHEET NO. C-22

RECORD DRAWING

XREFs: [Wetland Survey Dwg - WSP 9.2.15, Final_Grading-Working, Full Site Survey Revised 5.11.16, C001GRPL, CDMS_2436, 20250827 andover sheet 3.liner, 20250827 ANDOVER. SHEET 1. CULVERT, 20250827 andover. sheet 2.subgrade, 20250915 ANDOVER. SHEET 4.FINAL GRADING] Images: []
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APPROXIMATE LIMITS OF VERNAL POOLS

VERNAL POOLS

GROUNDWATER MONITORING WELL (TYP. OF 12) — 4 D-7

NON-JURISDICTIONAL STATE/LOCAL ISOLATED WETLANDS

PASSIVE GAS VENT (TYP. OF 26) — 1 D-7

100-FT BUFFER ZONE TO VERNAL POOL

75-FT BUFFER ZONE TO VERNAL POOL

PROPERTY LINE

50 FT. NO DISTURB

75 FT. NO BUILD

LIMIT OF LANDFILL

12" DIA HDPE PIPE

INVERT = 166.22 FES

ARTICULATED CONCRETE BLOCK MAT (TYP.)

OCS STRUCTURE
RIM ELEV = 174.38
INVERT = 168.08

MW-11SR

LFG-22

LFG-21

LFG-20

LFG-19

LFG-18

LFG-17

VENT 4

VENT 5

VENT 6

VENT 7

VENT 15

VENT 16

VENT 17

VENT 20

VENT 21

VENT 22

VENT 24

VENT 25

VENT 26

CDM-4SR
CDM-4DR

BENCHMARK: TBM-1
RAIL ROAD SPIKE SET 1' ABOVE GRADE IN UTILITY POLE #52225.90.
ELEVATION = 193.28'

TANGENT EDGE OF CAP

CHANDLER ROAD

NON-JURISDICTIONAL STATE/LOCAL ISOLATED WETLANDS

3 D-7 HORIZONTAL GAS COLLECTION TRENCH PASSIVE GAS VENT (TYP. OF 13)

3 D-7 HORIZONTAL GAS COLLECTION TRENCH BOTTOM OF TRENCH AT EL. 183 OR BEDROCK

2 D-7 LANDFILL GAS MONITORING WELL (TYP. OF 22)

MATCH LINE – C-24

PROPOSED LEGEND

- PROPOSED PASSIVE GAS VENT
- PROPOSED HORIZONTAL GAS COLLECTION TRENCH
- PROPOSED LANDFILL GAS MONITORING WELL
- PROPOSED GROUNDWATER MONITORING WELL

NOTES:
1. FOR EXISTING CONDITIONS NOTES AND LEGEND, SEE SHEET G-2.
2. PROPOSED MONITORING WELL LOCATIONS SHALL BE STAKED BY CONTRACTOR FOR VERIFICATION BY ENGINEER.
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4. TO THE EXTENT POSSIBLE, TRENCH EXCAVATION AND CONSTRUCTION SHALL OCCUR WHEN THE GROUNDWATER TABLE IS EXPECTED TO BE AT A SEASONALLY LOW ELEVATION.

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By NATHAN JONES Date 10/30/2025

CDM Smith

1" = 40'
20 0 40

REV. NO.	DATE	DRWN	CHKD	REMARKS
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DATE: OCTOBER 2025

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Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

ENVIRONMENTAL MONITORING NETWORK AND LANDFILL GAS MANAGEMENT SYSTEM LAYOUT (SHEET 1 OF 3)

PROJECT NO. 0235-113811
FILE NAME: C023-GVPL.DWG
SHEET NO. C-23

RECORD DRAWING

XREFs: [Wetland Survey Dwg – WSP 9.2.15, Final Grading-Working, Full Site Survey Revised 5.11.16, C001GRPL, 16365-CS-BN, CDMS_2436, 20250827 andover sheet 3.liner, 20250827 ANDOVER. SHEET 1. CULVERT, 20250827 andover. sheet 2.subgrade, 20250915 ANDOVER. SHEET 4.FINAL GRADING] Images: []
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MATCH LINE – C-23

MATCH LINE C-25

VENT 9
VENT 10
VENT 11
VENT 12
VENT 13
VENT 14
VENT 18
VENT 19
VENT 23

LFG-5
LFG-6
LFG-7
LFG-9
LFG-10
LFG-11
LFG-12
LFG-13
LFG-14
LFG-15
LFG-16

MW-12D
MW-12S

PROPERTY LINE
100 FT BUFFER
75 FT NO BUILD
50 FT NO DISTURB

GREENWOOD ROAD
LEDGE ROAD

BENCHMARK: TBM-3
LARGE MAGNAIL SET IN
BASE OF 24" OAK TREE.
ELEVATION = 175.51'

BENCHMARK: TBM-6
RAIL ROAD SPIKE SET IN
BASE OF UTILITY POLE #4760.
ELEVATION = 172.55'

PASSIVE GAS VENT (TYP. OF 26) — 1/D-7

INSTALL VENT WITH ELBOW SUCH THAT RISER IS OFF OF ACCESS ROAD — 3/D-7

HORIZONTAL GAS COLLECTION TRENCH PASSIVE GAS VENT (TYP. OF 13) — 3/D-7

3/D-7 HORIZONTAL GAS COLLECTION TRENCH BOTTOM OF TRENCH AT EL. 160

3/D-7 HORIZONTAL GAS COLLECTION TRENCH BOTTOM OF TRENCH AT EL. 183

2/D-7 LANDFILL GAS MONITORING WELL (TYP. OF 22)

NON-JURISDICTIONAL STATE/LOCAL ISOLATED WETLANDS

3/D-7 HORIZONTAL GAS COLLECTION TRENCH BOTTOM OF TRENCH AT EL. 160

PROPOSED LEGEND

- PROPOSED PASSIVE GAS VENT
- PROPOSED HORIZONTAL GAS COLLECTION TRENCH
- PROPOSED LANDFILL GAS MONITORING WELL
- PROPOSED GROUNDWATER MONITORING WELL

NOTES:
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By NATHAN JONES Date 10/30/2025

CDM Smith

1" = 40'
20 0 40

REV. NO.	DATE	DRWN	CHKD	REMARKS
4	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
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1	1/2018	NEJ	ABM	REVISED TO RESPOND TO MASSDEP 12/14/2017 NOTICE OF TECHNICAL DEFICIENCY

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SHEET CHK'D BY: C. GABEL
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APPROVED BY: N. JONES
DATE: OCTOBER 2025

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Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

ENVIRONMENTAL MONITORING NETWORK AND LANDFILL GAS MANAGEMENT SYSTEM LAYOUT (SHEET 2 OF 3)

PROJECT NO. 0235-113811
FILE NAME: C024-GVPL.DWG
SHEET NO. C-24

RECORD DRAWING

XREFs: [Wetland Survey Dwg - WSP 9.2.15, Final_Grading-Working, Full Site Survey Revised 5.11.16, C001GRPL, 16365-CS-BN, CDMS_2436, 20250827 andover. sheet 2.subgrade, 20250915 ANDOVER. SHEET 4.FINAL GRADING] Images: []
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PZ-1R
100 FT BUFFER
75 FT NO BUILD
50 FT NO DISTURB
PROJECT LIMIT
PROPERTY LINE
INV=148.12 24"CMP
INV=145.53 12"CI
INV=146.00 12"CI
INV=144.78 15"RCP
50 FT NO DISTURB
75 FT NO BUILD
BENCHMARK: PBM-5
RAIL ROAD SPIKE SET IN BASE OF 18" PINE TREE. ELEVATION = 154.32'
BENCHMARK: TBM-4
RAIL ROAD SPIKE SET IN BASE OF 14" OAK TREE. ELEVATION = 162.54'
GRAVEL ACCESS ROAD (TYP.)
CDM-3SR
CDM-3MR
CDM-3DR
CDM-17S
CDM-18S
CDM-2SR/CDM-2MR
LFG-1
LFG-2
LFG-3
LFG-4
VENT 1
VENT 2
VENT 3
VENT 8
165.67
165.64
165.63
165.74
165.85
12" DIA HDPE PIPE
FES INVERT = 157.99
OCS STRUCTURE FLUSHLEY INVERT = 168.74
50 FOOT WIDE DRAIN EASEMENT (BOOK 1191, PAGE 656)
NON-JURISDICTIONAL STATE/LOCAL ISOLATED WETLANDS
GROUNDWATER MONITORING WELL (TYP. OF 12) 4/D-7
HORIZONTAL GAS COLLECTION TRENCH BOTTOM OF TRENCH AT EL. 155 3/D-7
PETTINGELL AVENUE
DMH RIM=154.65 I(A)=150.90 I(B)=150.90
CB RIM=163.37 I(A)=159.17 I(B)=159.17

MATCH LINE C-24

PROPOSED LEGEND

- PROPOSED PASSIVE GAS VENT
- PROPOSED HORIZONTAL GAS COLLECTION TRENCH
- PROPOSED LANDFILL GAS MONITORING WELL
- PROPOSED GROUNDWATER MONITORING WELL

NOTES:
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1/D-7 PASSIVE GAS VENT (TYP. OF 26)
3/D-7 HORIZONTAL GAS COLLECTION TRENCH PASSIVE GAS VENT (TYP. OF 13)
2/D-7 LANDFILL GAS MONITORING WELL (TYP. OF 22)

RECORD DRAWING

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NATHAN JONES
CDM Smith

1" = 40'
20 0 40

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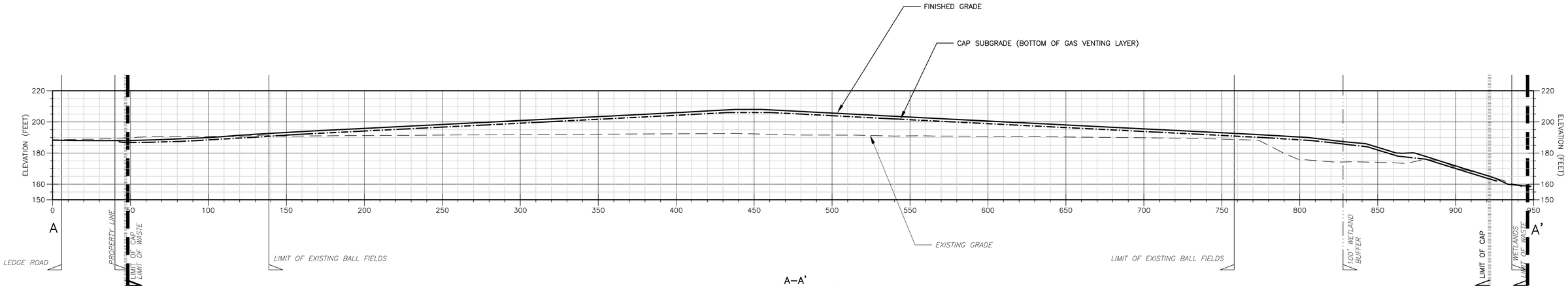
TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

ENVIRONMENTAL MONITORING NETWORK AND LANDFILL GAS MANAGEMENT SYSTEM LAYOUT (SHEET 3 OF 3)

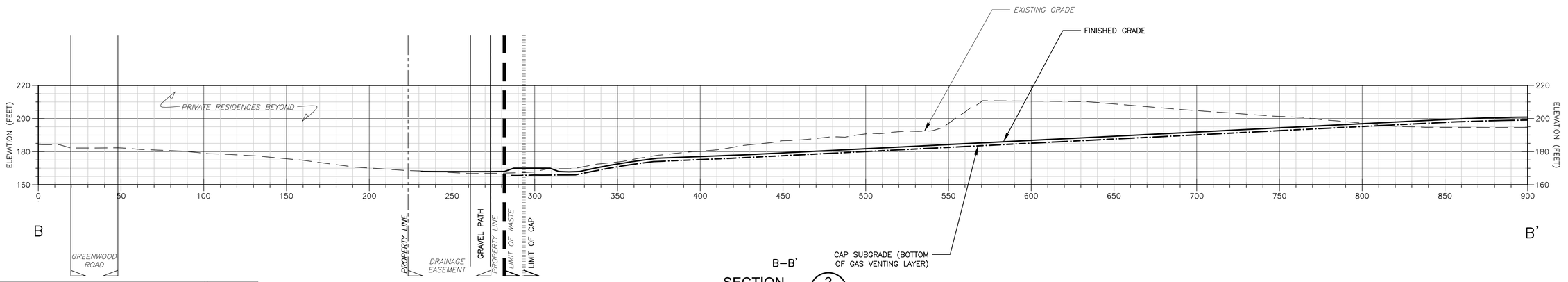
PROJECT NO. 0235-113811
FILE NAME: C025-GVPL.DWG
SHEET NO. C-25

RECORD DRAWING



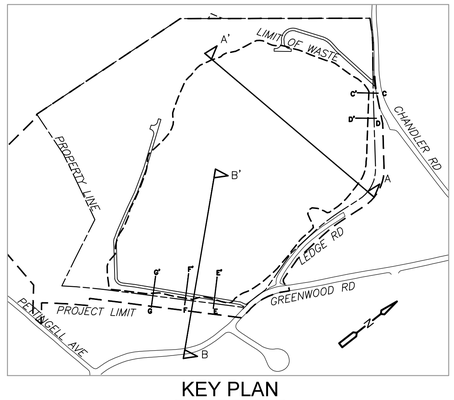
A–A'
SECTION 1
1"=30'
C–26

1" = 30'
15 0 30



B–B'
SECTION 2
1"=30'
C–26

1" = 30'
15 0 30



KEY PLAN
N.T.S.

LEGEND:

EXISTING SITE FEATURES

PROPOSED SITE FEATURES

- *EXISTING GRADE*
- FINISHED GRADE
- CAP SUBGRADE

RECORD DRAWING

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By NATHAN JONES Date 10/30/2025

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TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

CROSS SECTIONS A-A', B-B'

PROJECT NO. 0235-113811
FILE NAME: C026STCSRD.DWG
SHEET NO. C-26

RECORD DRAWING

XREFs: [Wetland Survey Dwg - WSP 9.2.15, FinaL Grading-Working, Full Site Survey Revised 5.11.16, C001GRPL, CDMS_2436, 20250328 andover sheet 3.liner, 20250328 ANDOVER. SHEET 1. CULVERT, 20250328 andover. sheet 2.subgrade, 20250328 ANDOVER. SHEET 4.FINAL GRADING] Images: []
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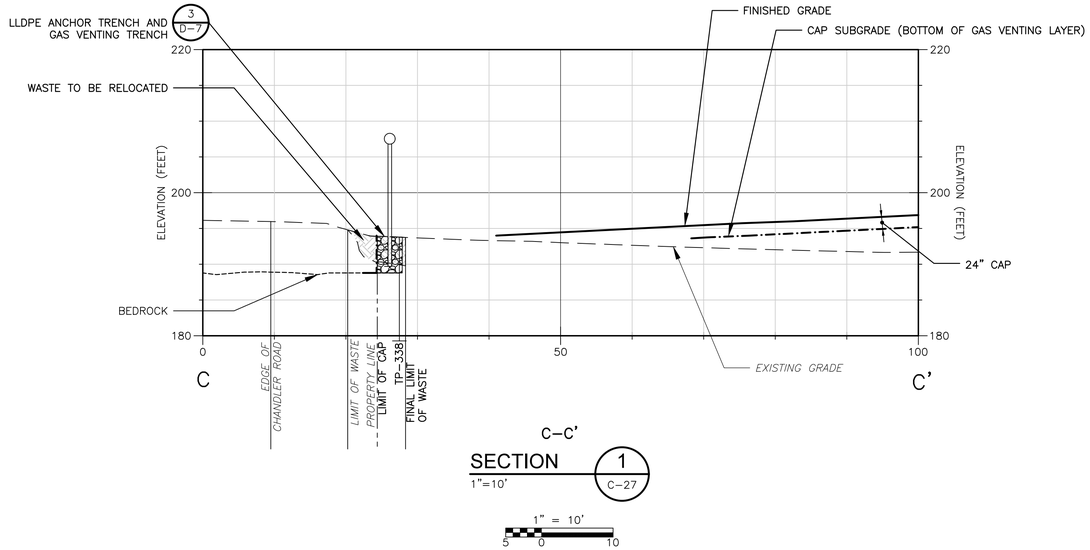


C–C'

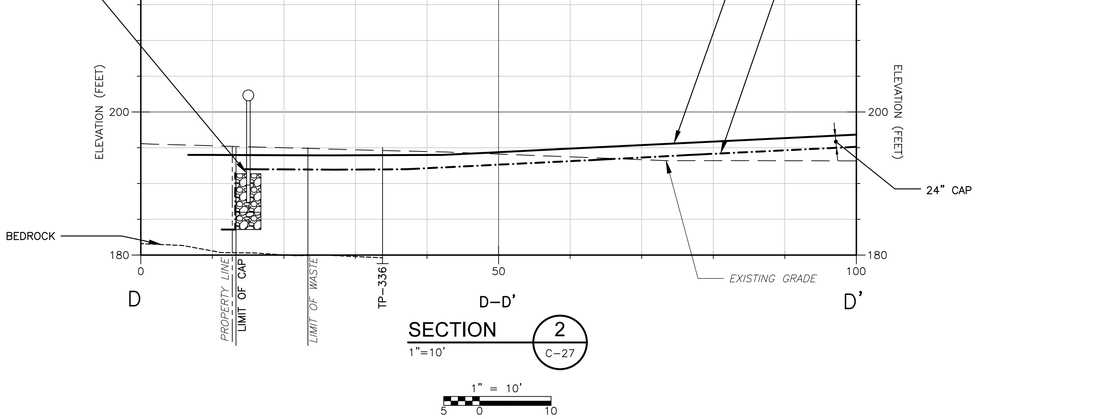
SECTION 1

1"=10'

C-27

1" = 10'

5 0 10



D–D'

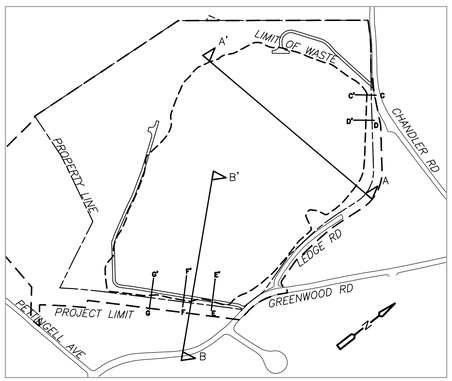
SECTION 2

1"=10'

C-27

1" = 10'

5 0 10



KEY PLAN

N.T.S.

LEGEND:

EXISTING SITE FEATURES

PROPOSED SITE FEATURES

WASTE TO BE RELOCATED

EXISTING GRADE

FINISHED GRADE

CAP SUBGRADE

TOP OF BEDROCK

RECORD DRAWING

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By NATHAN JONES Date 10/30/2025

CDM Smith

REV. NO.	DATE	DRWN	CHKD	REMARKS
3	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
2	3/2023	JRH	NEJ	UPDATED FOR BIDDING
1	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE / DPW MATERIALS HANDLING AREA

DESIGNED BY: G. HOWARD
DRAWN BY: R. FOGG
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

CDM Smith
75 State Street, Suite 701
Boston, MA 02109
Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

CROSS SECTIONS C-C', D-D'

PROJECT NO. 0235-113811
FILE NAME: C027STCSRD.DWG

SHEET NO. C-27

RECORD DRAWING

XREFs: [Wetland Survey Dwg - WSP 9.2.15, Final_Grading-Working, Full Site Survey Revised 5.11.16, C001GRPL, CDMS_2436, 20250328 andover sheet 3.liner, 20250328 ANDOVER. SHEET 1. CULVERT, 20250328 andover. sheet 2.subgrade, 20250328 ANDOVER. SHEET 4.FINAL GRADING] Images: []
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pw:\\cdmsmith-az02-pw.bentley.com:pw_p1\0235\113811\04 Design Services NM_1002\02 Civil\10 CADD\2025 RECORD DRAWINGS\C027STCSRD.dwg
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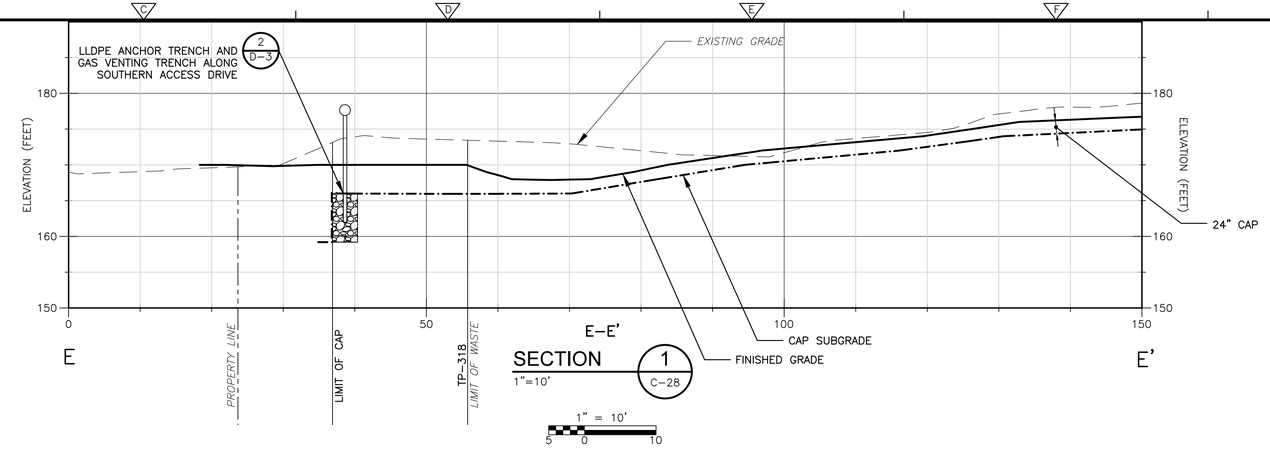

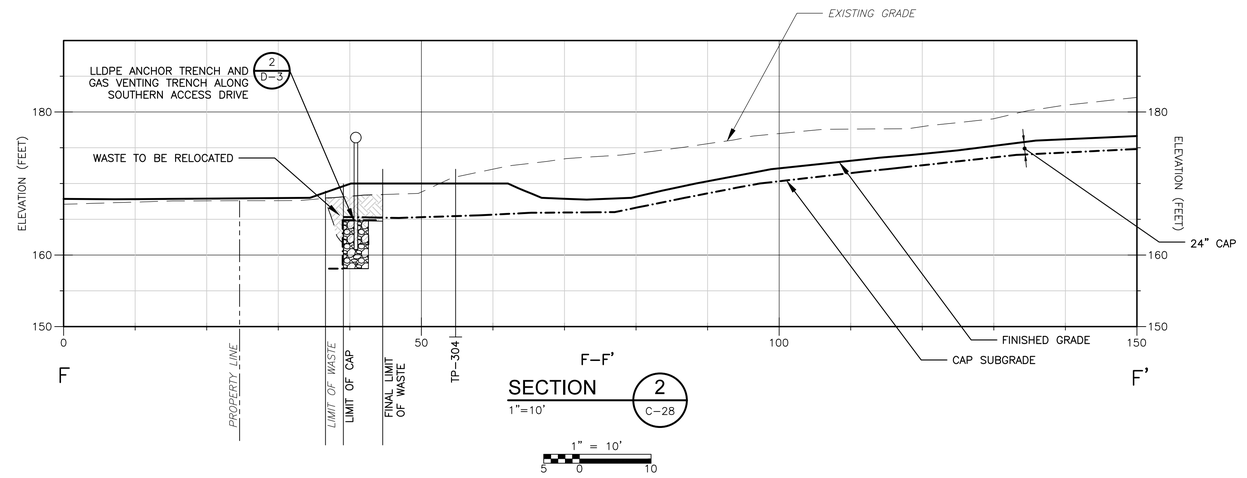

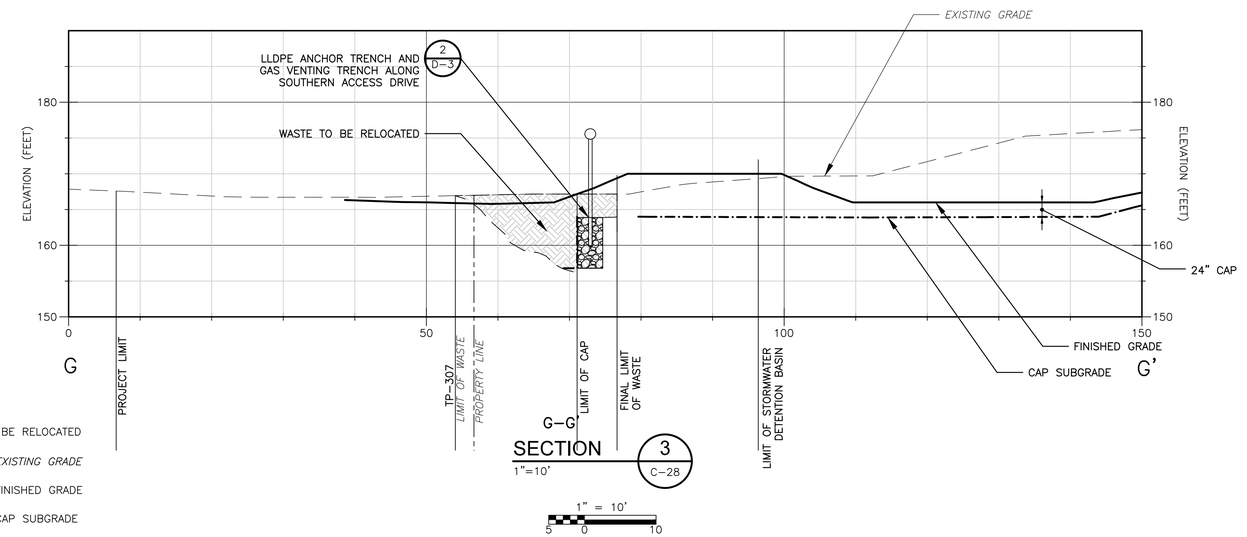

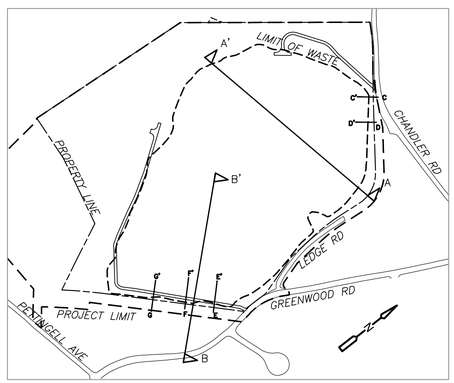

KEY PLAN
N.T.S.

LEGEND:

EXISTING SITE FEATURES

PROPOSED SITE FEATURES

- WASTE TO BE RELOCATED
- *EXISTING GRADE*
- FINISHED GRADE
- CAP SUBGRADE

RECORD DRAWING

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By NATHAN JONES Date 10/30/2025

CDM Smith

REV. NO.	DATE	DRWN	CHKD	REMARKS
3	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
2	3/2023	JRH	NEJ	UPDATED FOR BIDDING
1	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE / DPW MATERIALS HANDLING AREA

DESIGNED BY: G. HOWARD
DRAWN BY: R. FOGG
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

CDM Smith
75 Eastern Street, Suite 701
Boston, MA 02109
Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

CROSS SECTIONS E-E', F-F', G-G'

PROJECT NO. 0235-113811
FILE NAME: C028STCSRD.DWG
SHEET NO. C-28

RECORD DRAWING

XREFs: [Wetland Survey Dwg - WSP 9.2.15, Final_Grading-Working, Full Site Survey Revised 5.11.16, C001GRPL, CDMS_2436, 20250328 andover sheet 3.liner, 20250328 ANDOVER. SHEET 1. CULVERT, 20250328 andover. sheet 2.subgrade, 20250328 ANDOVER. SHEET 4.FINAL GRADING] Images: []
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XREFs: [Wetland Survey Dwg - WSP 9.2.15, Final_Grading-Working, Full Site Survey Revised 5.11.16, C001GRPL, C023-GVPL_OLDFILE, C001DRN, 16365-CS-BN, CDMS_2436, 20250827 ANDOVER, SHEET 1, CULVERT] Images: []
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OUTFALL (FLARED END)
INVERT 156.01
1:1 D-10

FES4

18" RCP
SLOPE 1.75%

50 FOOT WIDE DRAIN EASEMENT
(BOOK 1191, PAGE 656)

18" RCP SLOPE 0.94%

8 D-10
DMH
R=160.01
I(IN)=156.43
I(OUT)=156.38

CB WITH APRON 1&9 D-10
R=169.05
I(OUT)=165.28

8" METAL CULVERT

8 D-10
DMH
R=169.82
I(IN)=162.00
I(OUT)=161.91

18" RCP
SLOPE 1.34%

CB WITH APRON 9 D-10
R=168.72
I(OUT)=164.54

CB WITH APRON 1&9 D-10
R=169.0
I(OUT)=165.4

8" METAL CULVERT

15" RCP
SLOPE 1.00%

EXISTING DMH
I(IN)=166.40
I(OUT)=166.10

8 D-10
DMH
R=169.7
I(IN)=165.7 (NORTH)
I(IN)=165.3 (WEST)
I(OUT)=165.25 (SOUTH)

18" RCP
SLOPE 1.33%

8 D-10
DMH
R=169.11
I(IN)=164.57 (NORTH)
I(OUT)=164.54 (SOUTH)
I(IN)=164.32 (EAST)
I(IN)=164.71 (WEST)

12" RCP

BENCHMARK: TBM-6
RAIL ROAD SPIKE SET IN
BASE OF UTILITY POLE #4760.
ELEVATION = 172.55'

ACCESS ROAD
LEDGE ROAD
GREENWOOD ROAD
TRINITY COURT
SWAMP
BUILDING
#164
#166
#165
#167
#170
#171
#1

RECORD DRAWING

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By _____ Date 10/30/2025
NATHAN JONES
CDM Smith

1" = 40'
20 0 40

REV. NO.	DATE	DRWN	CHKD	REMARKS
4	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
3	3/2023	JRH	NEJ	UPDATED FOR BIDDING
2	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE / DPW MATERIALS HANDLING AREA
1	4/2017	JRH	NEJ	REVISED TO RESPOND TO CONSERVATON COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY: N. JONES
DRAWN BY: N. JONES
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

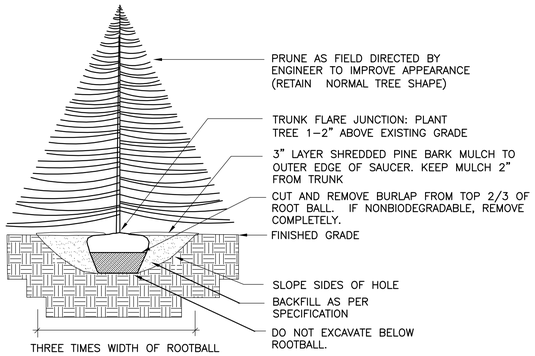
CDM Smith
75 State Street, Suite 701
Boston, MA 02109
Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

GREENWOOD ROAD
STORM DRAIN LAYOUT PLAN

PROJECT NO. 0235-113811
FILE NAME: C029SDPLRD.DWG
SHEET NO.
C-29

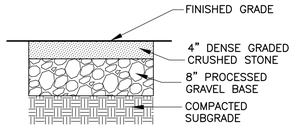
RECORD DRAWING


PRUNE AS FIELD DIRECTED BY ENGINEER TO IMPROVE APPEARANCE (RETAIN NORMAL TREE SHAPE)
TRUNK FLARE JUNCTION: PLANT TREE 1–2" ABOVE EXISTING GRADE
3" LAYER SHREDDED PINE BARK MULCH TO OUTER EDGE OF SAUCER. KEEP MULCH 2" FROM TRUNK
CUT AND REMOVE BURLAP FROM TOP 2/3 OF ROOT BALL. IF NONBIODEGRADABLE, REMOVE COMPLETELY.
FINISHED GRADE
SLOPE SIDES OF HOLE
BACKFILL AS PER SPECIFICATION
DO NOT EXCAVATE BELOW ROOTBALL.
THREE TIMES WIDTH OF ROOTBALL

EVERGREEN TREE PLANTING

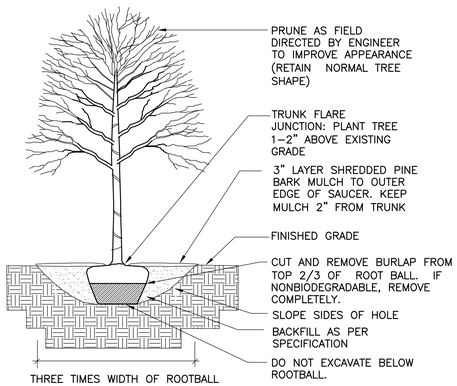
DETAIL 5
NOT TO SCALE D–1

NOTE:
1. FOR ALL TREES PLANTED WITHIN THE LIMITS OF THE LLDPE, THERE MUST BE A MINIMUM OF 4–FT BETWEEN THE BOTTOM OF THE ROOTBALL AND THE TOP OF THE LLDPE.



CRUSHED STONE SURFACING

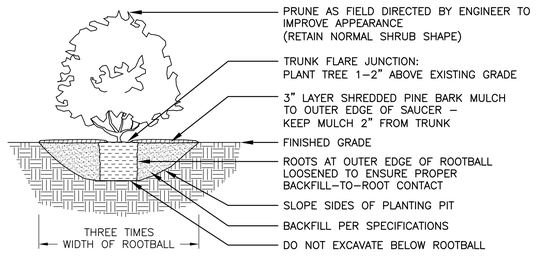
DETAIL 3
NOT TO SCALE D–1


PRUNE AS FIELD DIRECTED BY ENGINEER TO IMPROVE APPEARANCE (RETAIN NORMAL TREE SHAPE)
TRUNK FLARE JUNCTION: PLANT TREE 1–2" ABOVE EXISTING GRADE
3" LAYER SHREDDED PINE BARK MULCH TO OUTER EDGE OF SAUCER. KEEP MULCH 2" FROM TRUNK
FINISHED GRADE
CUT AND REMOVE BURLAP FROM TOP 2/3 OF ROOT BALL. IF NONBIODEGRADABLE, REMOVE COMPLETELY.
SLOPE SIDES OF HOLE
BACKFILL AS PER SPECIFICATION
DO NOT EXCAVATE BELOW ROOTBALL.
THREE TIMES WIDTH OF ROOTBALL

DECIDUOUS TREE PLANTING

DETAIL 4
NOT TO SCALE D–1

NOTE:
1. FOR ALL TREES PLANTED WITHIN THE LIMITS OF THE LLDPE, THERE MUST BE A MINIMUM OF 4–FT BETWEEN THE BOTTOM OF THE ROOTBALL AND THE TOP OF THE LLDPE.


PRUNE AS FIELD DIRECTED BY ENGINEER TO IMPROVE APPEARANCE (RETAIN NORMAL SHRUB SHAPE)
TRUNK FLARE JUNCTION: PLANT TREE 1–2" ABOVE EXISTING GRADE
3" LAYER SHREDDED PINE BARK MULCH TO OUTER EDGE OF SAUCER – KEEP MULCH 2" FROM TRUNK
FINISHED GRADE
ROOTS AT OUTER EDGE OF ROOTBALL LOOSENED TO ENSURE PROPER BACKFILL–TO–ROOT CONTACT
SLOPE SIDES OF PLANTING PIT
BACKFILL PER SPECIFICATIONS
DO NOT EXCAVATE BELOW ROOTBALL
THREE TIMES WIDTH OF ROOTBALL

SHRUB PLANTING

DETAIL 7
NOT TO SCALE D–1

NOTE:
1. FOR ALL SHRUBS PLANTED WITHIN THE LIMITS OF THE LLDPE, THERE MUST BE A MINIMUM OF 4–FT BETWEEN THE BOTTOM OF THE ROOT BALL AND THE TOP OF THE LLDPE.

RECORD DRAWING

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By NATHAN JONES Date 10/30/2025

CDM Smith

REV. NO.	DATE	DRWN	CHKD	REMARKS
4	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
3	3/2023	JRH	NEJ	UPDATED FOR BIDDING
2	11/2022	KAR	NEJ	REMOVED POST–CLOSURE USE / DPW MATERIALS HANDLING AREA
1	1/2018	JRH	NEJ	REVISED TO RESPOND TO MASSDEP 12/14/2017 NOTICE OF TECHNICAL DEFICIENCY

DESIGNED BY: G. HOWARD
DRAWN BY: J. HEIL
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

CDM Smith
75 State Street, Suite 701
Boston, MA 02109
Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

CIVIL DETAILS

PROJECT NO. 0235–113811
FILE NAME: D001CVDT.DWG

SHEET NO.
D-1

RECORD DRAWING

XREFs: [CDMS_2436] Images: [retaining wall detail]
Last saved by: YOUNGGK Time: 10/14/2025 2:56:42 PM
pw:\\cdmsmith-az02-pw.bentley.com:pw_p11\0235\113811\04 Design Services NM_100%\02 Civil\10 CADD\2025 RECORD DRAWINGS\D001CVDTRD.dwg
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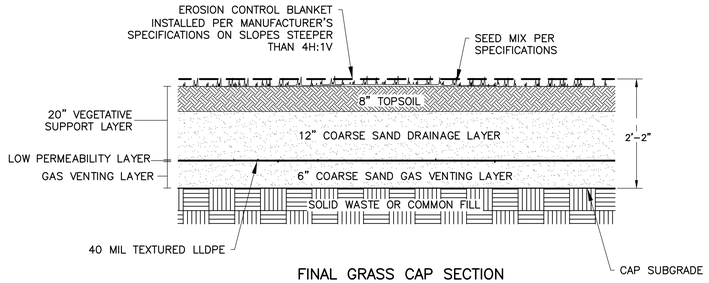
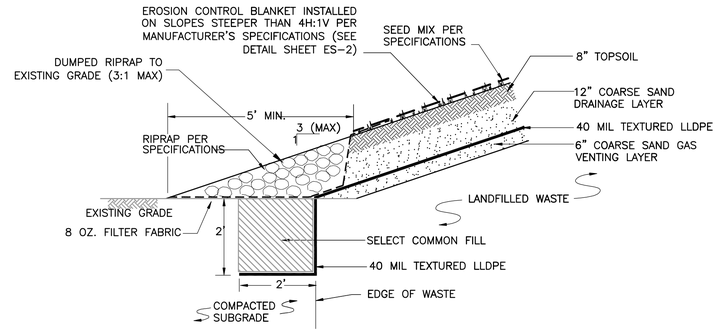

EROSION CONTROL BLANKET INSTALLED PER MANUFACTURER'S SPECIFICATIONS ON SLOPES STEEPER THAN 4H:1V
SEED MIX PER SPECIFICATIONS
8" TOPSOIL
20" VEGETATIVE SUPPORT LAYER
12" COARSE SAND DRAINAGE LAYER
2'-2"
LOW PERMEABILITY LAYER
GAS VENTING LAYER
6" COARSE SAND GAS VENTING LAYER
SOLID WASTE OR COMMON FILL
40 MIL TEXTURED LLDPE
CAP SUBGRADE

FINAL GRASS CAP SECTION

DETAIL 1 / D-2

N.T.S

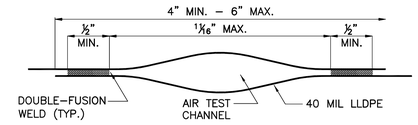


NOTE:
1. LANDFILLED WASTE OUTSIDE PROPOSED LIMIT OF CAP TO BE EXCAVATED TO UNDISTURBED EARTH AND LANDFILLED ON-SITE. EXCAVATION TO BE REPLACED WITH COMMON FILL AND 6" OF TOPSOIL (TYP.).
2. DO NOT INSTALL RIPRAP ALONG THE DOUBLE LINED BASINS

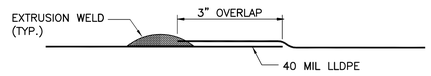
ANCHOR TRENCH WITH RIPRAP

DETAIL 4 / D-2

N.T.S



DOUBLE FUSION WELD
(SEE SPECIFICATIONS)

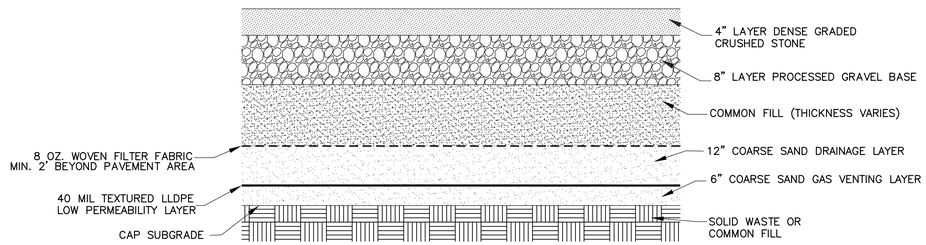


EXTRUSION WELD
(SEE SPECIFICATIONS)

LLDPE WELD DETAIL

DETAIL 5 / D-2

N.T.S


4" LAYER DENSE GRADED CRUSHED STONE
8" LAYER PROCESSED GRAVEL BASE
COMMON FILL (THICKNESS VARIES)
8 OZ. WOVEN FILTER FABRIC MIN. 2' BEYOND PAVEMENT AREA
12" COARSE SAND DRAINAGE LAYER
6" COARSE SAND GAS VENTING LAYER
40 MIL TEXTURED LLDPE LOW PERMEABILITY LAYER
SOLID WASTE OR COMMON FILL
CAP SUBGRADE

FINAL GRAVEL CAP SECTION

DETAIL 3 / D-2

N.T.S

RECORD DRAWING

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By NATHAN JONES Date 10/30/2025

CDM Smith

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2	3/2023	JRH	NEJ	UPDATED FOR BIDDING
1	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE / DPW MATERIALS HANDLING AREA

DESIGNED BY: E. SCHICK
DRAWN BY: E. SCHICK
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

CDM Smith
75 State Street, Suite 701
Boston, MA 02109
Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

LANDFILL DETAILS I

PROJECT NO. 0235-113811
FILE NAME: D002LFDT.DWG

SHEET NO.
D-2

RECORD DRAWING

XREFs: [Wetland Survey Dwg - WSP 9.2.15, Final_Grading-Working, Full Site Survey Revised 5.11.16, C001GRPL, CDMS_2436, 20250328 andover, sheet 2.subgrade, 20250328 ANDOVER. SHEET 4.FINAL GRADING] Images: []
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XREFs: [Wetland Survey Dwg - WSP 9.2.15, Final_Grading-Working, Full Site Survey Revised 5.11.16, C001GRPL, CDMS_2436, 20250328 andover, sheet 2.subgrade, 20250328 ANDOVER. SHEET 1. CULVERT, 20250328 andover. sheet 2.subgrade, 20250328 ANDOVER. SHEET 4.FINAL GRADING] Images: []
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pw:\\cdmsmith-az02-pw.bentley.com:pw_p11\0235\113811\04 Design Services NM_1002%\02 Civil\10 CADD\2025 RECORD DRAWINGS\D002LFDTRD.dwg
XREFs: [Wetland Survey Dwg - WSP 9.2.15, Final_Grading-Working, Full Site Survey Revised 5.11.16, C001GRPL, CDMS_2436, 20250328 andover, sheet 2.subgrade, 20250328 ANDOVER. SHEET 1. CULVERT, 20250328 andover. sheet 3.liner, 20250328 ANDOVER. SHEET 4.FINAL GRADING] Images: []
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pw:\\cdmsmith-az02-pw.bentley.com:pw_p11\0235\113811\04 Design Services NM_1002%\02 Civil\10 CADD\2025 RECORD DRAWINGS\D002LFDTRD.dwg
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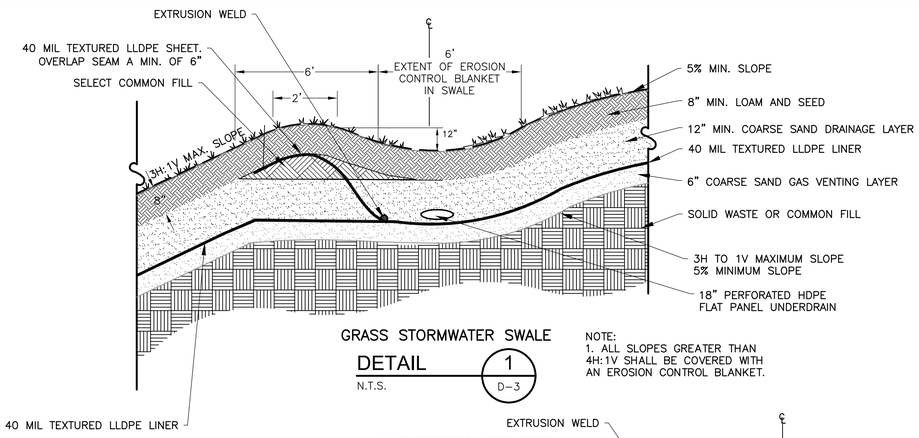
By _____ Date 10/30/2025

NATHAN JONES

CDM Smith

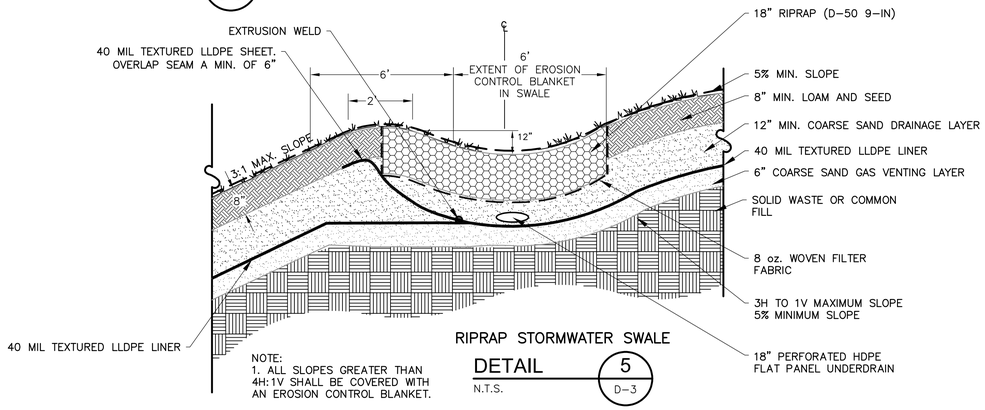

EXTRUSION WELD
40 MIL TEXTURED LLDPE SHEET. OVERLAP SEAM A MIN. OF 6"
SELECT COMMON FILL
6'
EXTENT OF EROSION CONTROL BLANKET IN SWALE
2'
12"
3H:1V MAX. SLOPE
8"
5% MIN. SLOPE
8" MIN. LOAM AND SEED
12" MIN. COARSE SAND DRAINAGE LAYER
40 MIL TEXTURED LLDPE LINER
6" COARSE SAND GAS VENTING LAYER
SOLID WASTE OR COMMON FILL
3H TO 1V MAXIMUM SLOPE
5% MINIMUM SLOPE
18" PERFORATED HDPE FLAT PANEL UNDERDRAIN
40 MIL TEXTURED LLDPE LINER

GRASS STORMWATER SWALE

DETAIL 1 / D-3

N.T.S.

NOTE:
1. ALL SLOPES GREATER THAN 4H:1V SHALL BE COVERED WITH AN EROSION CONTROL BLANKET.

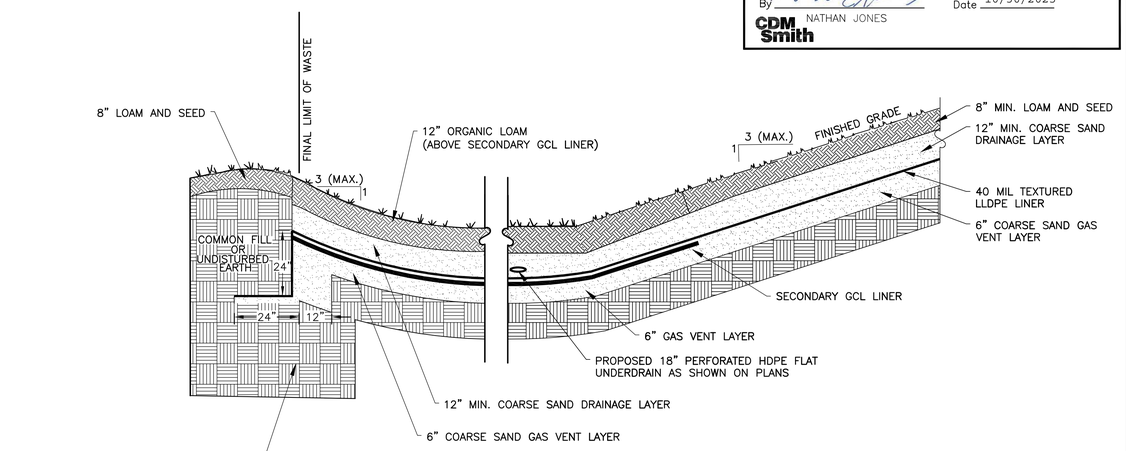

EXTRUSION WELL
40 MIL TEXTURED LLDPE SHEET. OVERLAP SEAM A MIN. OF 6"
6'
EXTENT OF EROSION CONTROL BLANKET IN SWALE
2'
12"
3:1 MAX. SLOPE
8"
18" RIPRAP (D-50 9-IN)
5% MIN. SLOPE
8" MIN. LOAM AND SEED
12" MIN. COARSE SAND DRAINAGE LAYER
40 MIL TEXTURED LLDPE LINER
6" COARSE SAND GAS VENTING LAYER
SOLID WASTE OR COMMON FILL
8 oz. WOVEN FILTER FABRIC
3H TO 1V MAXIMUM SLOPE
5% MINIMUM SLOPE
18" PERFORATED HDPE FLAT PANEL UNDERDRAIN
40 MIL TEXTURED LLDPE LINER

RIPRAP STORMWATER SWALE

DETAIL 5 / D-3

N.T.S.

NOTE:
1. ALL SLOPES GREATER THAN 4H:1V SHALL BE COVERED WITH AN EROSION CONTROL BLANKET.

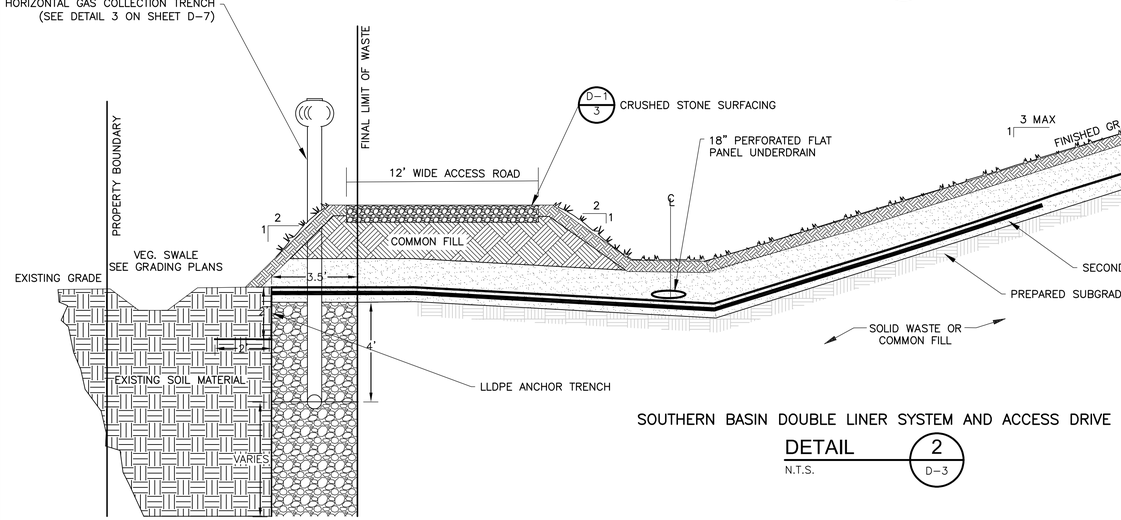

8" LOAM AND SEED
FINAL LIMIT OF WASTE
12" ORGANIC LOAM (ABOVE SECONDARY GCL LINER)
3 (MAX.)
1
FINISHED GRADE
8" MIN. LOAM AND SEED
12" MIN. COARSE SAND DRAINAGE LAYER
40 MIL TEXTURED LLDPE LINER
6" COARSE SAND GAS VENT LAYER
COMMON FILL OR UNDISTURBED EARTH
24"
24"
12"
SECONDARY GCL LINER
6" GAS VENT LAYER
PROPOSED 18" PERFORATED HDPE FLAT UNDERDRAIN AS SHOWN ON PLANS
12" MIN. COARSE SAND DRAINAGE LAYER
6" COARSE SAND GAS VENT LAYER
SOLID WASTE OUTSIDE PROPOSED LIMIT OF CAP TO BE EXCAVATED TO UNDISTURBED EARTH AND RELOCATED TO BENEATH CAP. EXCAVATION TO BE REPLACED WITH COMMON FILL AND 8" OF TOPSOIL (TYP.)

WETLAND AREA DOUBLE LINER SYSTEM

DETAIL 3 / D-3

N.T.S.

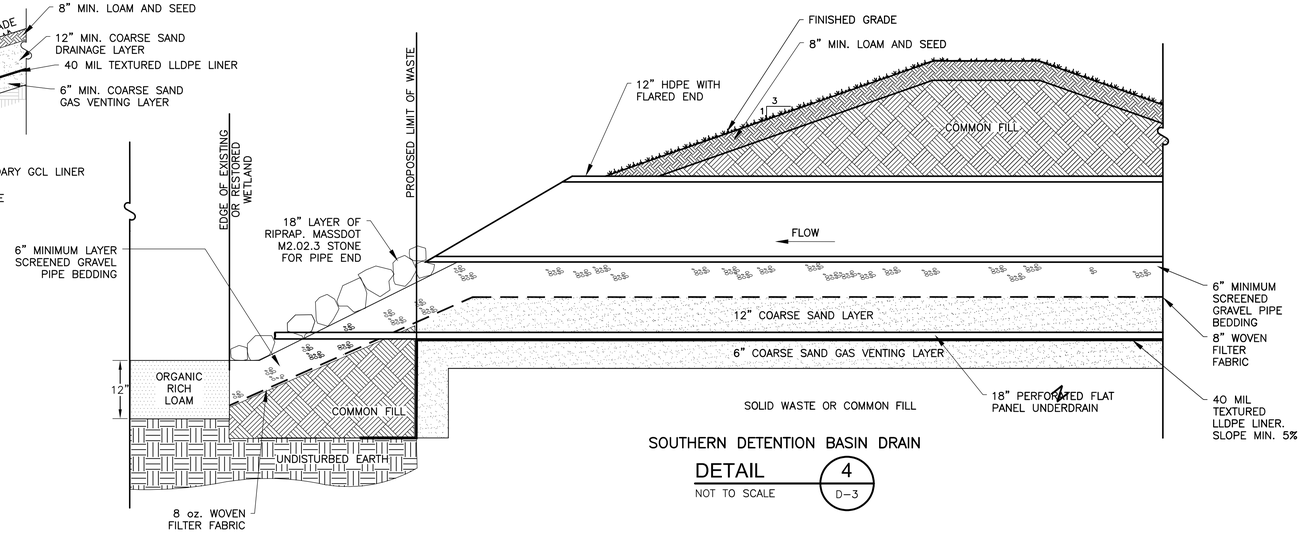
NOTE:
1. ALL SLOPES GREATER THAN 4H:1V SHALL BE COVERED WITH AN EROSION CONTROL BLANKET.



SOUTHERN BASIN DOUBLE LINER SYSTEM AND ACCESS DRIVE

DETAIL 2 / D-3

N.T.S.


EDGE OF EXISTING OR RESTORED WETLAND
PROPOSED LIMIT OF WASTE
18" LAYER OF RIPRAP, MASSDOT M2.02.3 STONE FOR PIPE END
6" MINIMUM LAYER SCREENED GRAVEL PIPE BEDDING
12"
ORGANIC RICH LOAM
COMMON FILL
UNDISTURBED EARTH
8 oz. WOVEN FILTER FABRIC
12" HDPE WITH FLARED END
FINISHED GRADE
8" MIN. LOAM AND SEED
3
1
COMMON FILL
FLOW
12" COARSE SAND LAYER
6" COARSE SAND GAS VENTING LAYER
SOLID WASTE OR COMMON FILL
18" PERFORATED FLAT PANEL UNDERDRAIN
6" MINIMUM SCREENED GRAVEL PIPE BEDDING
8" WOVEN FILTER FABRIC
40 MIL TEXTURED LLDPE LINER. SLOPE MIN. 5%

SOUTHERN DETENTION BASIN DRAIN

DETAIL 4 / D-3

NOT TO SCALE

REV. NO.	DATE	DRWN	CHKD	REMARKS
4	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
3	3/2023	JRH	NEJ	UPDATED FOR BIDDING
2	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE / DPW MATERIALS HANDLING AREA
1	4/2017	NEJ	DJG	REVISED TO SHOW GCL ON SOUTHERN BASIN DETAIL

DESIGNED BY: E. SCHICK
DRAWN BY: E. SCHICK
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

CDM Smith
75 State Street, Suite 701
Boston, MA 02109
Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

LANDFILL DETAILS II

PROJECT NO. 0235-113811
FILE NAME: D003LFDT.DWG

SHEET NO.
D-3

RECORD DRAWING

XREFs: [CDMS_2436, 20250328 andover sheet 3.liner, 20250328 ANDOVER. SHEET 1. CULVERT, 20250328 andover. sheet 2.subgrade, 20250328 ANDOVER. SHEET 4.FINAL GRADING] Images: []
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By _____ Date 10/30/2025

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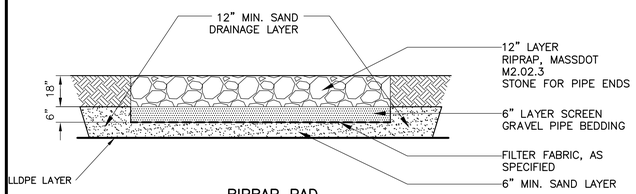
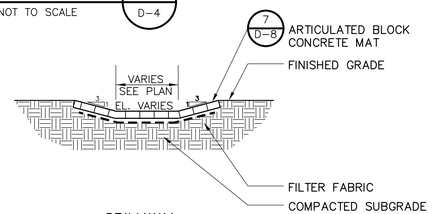

12" MIN. SAND DRAINAGE LAYER
12" LAYER RIPRAP, MASSDOT M2.02.3 STONE FOR PIPE ENDS
18"
6"
6" LAYER SCREEN GRAVEL PIPE BEDDING
FILTER FABRIC, AS SPECIFIED
6" MIN. SAND LAYER
LLDPE LAYER

RIPRAP PAD

DETAIL 1 / D-4

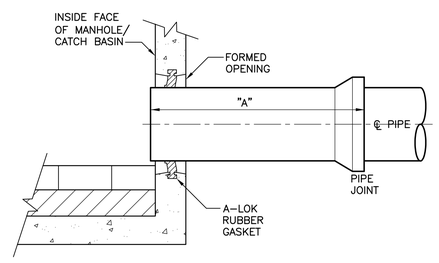
NOT TO SCALE



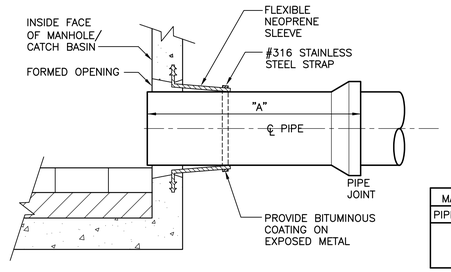
SPILLWAY

DETAIL 2 / D-4

SCALE: NTS

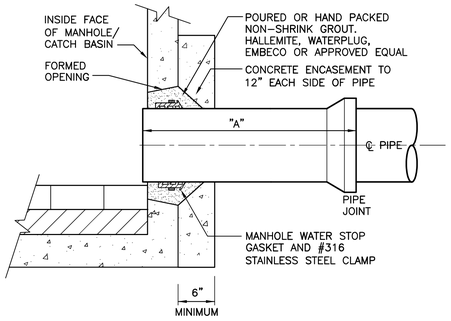


A-LOK SYSTEM

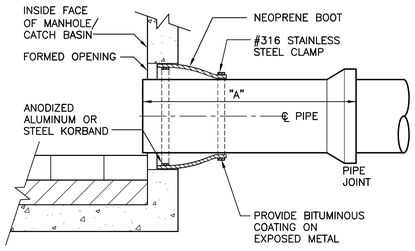


FLEXIBLE SLEEVE

MAXIMUM STUB LENGTH	
PIPE MATERIAL	"A" (MAX.)
RC	4'-0"
PVC	3'-3"
HDPE	3'-3"


INSIDE FACE OF MANHOLE/ CATCH BASIN
FORMED OPENING
POURED OR HAND PACKED NON-SHRINK GROUT. HALLEMITE, WATERPLUG, EMBECO OR APPROVED EQUAL
CONCRETE ENCASEMENT TO 12" EACH SIDE OF PIPE
"A"
℄ PIPE
PIPE JOINT
MANHOLE WATER STOP GASKET AND #316 STAINLESS STEEL CLAMP
6" MINIMUM

CONCRETE ENCASEMENT



KOR-N-SEAL BOOT

OTHER PIPE CONNECTIONS

DETAIL 7 / D-4

NOT TO SCALE

REV. NO.	DATE	DRWN	CHKD	REMARKS
4	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
3	3/2023	JRH	NEJ	UPDATED FOR BIDDING
2	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE / DPW MATERIALS HANDLING AREA
1	4/2017	JRH	NEJ	REVISED TO RESPOND TO CONSERVATON COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY: D. VELARDOCCHIA
DRAWN BY: J. HEIL
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

CDM Smith
75 State Street, Suite 701
Boston, MA 02109
Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

STORMWATER DETAILS I

PROJECT NO. 0235-113811
FILE NAME: D004SWDT.DWG

SHEET NO.
D-4

RECORD DRAWING

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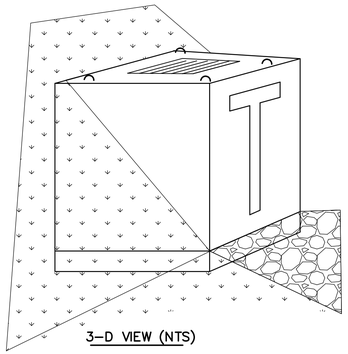
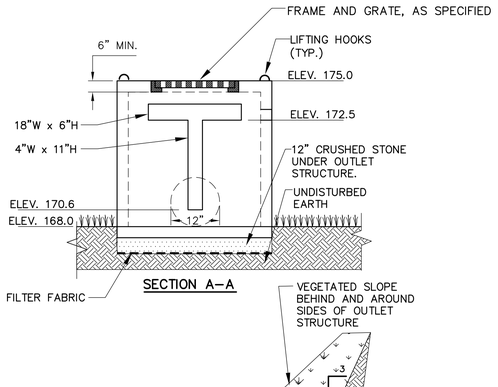
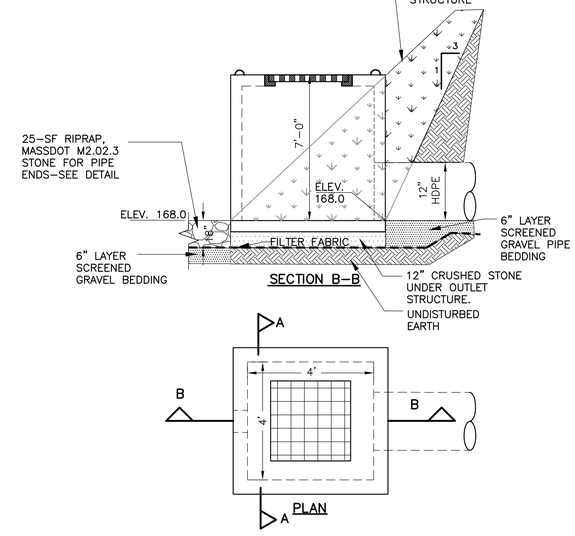


3-D VIEW (NTS)



SECTION A-A



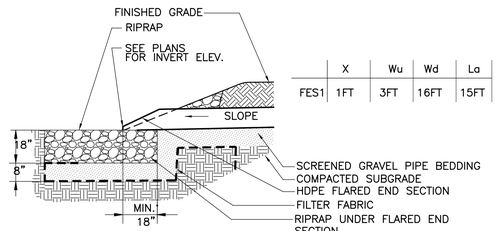
SECTION B-B

PLAN

PRECAST OUTLET CONTROL STRUCTURE - NORTH BASIN

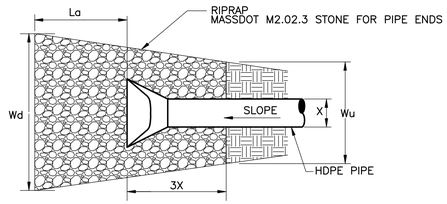
DETAIL 3 — D-5

NOT TO SCALE



	X	Wu	Wd	La
FES1	1FT	3FT	16FT	15FT

SECTION



PLAN

FLARED END SECTION (F.E.S.) - NORTH BASIN

DETAIL 2 — D-5

SCALE: NTS

REV. NO.	DATE	DRWN	CHKD	REMARKS
4	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
3	3/2023	JRH	NEJ	UPDATED FOR BIDDING
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DESIGNED BY: D. VELARDOCCHIA
DRAWN BY: J. HEIL
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

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75 State Street, Suite 701
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Tel: (617) 452-6000

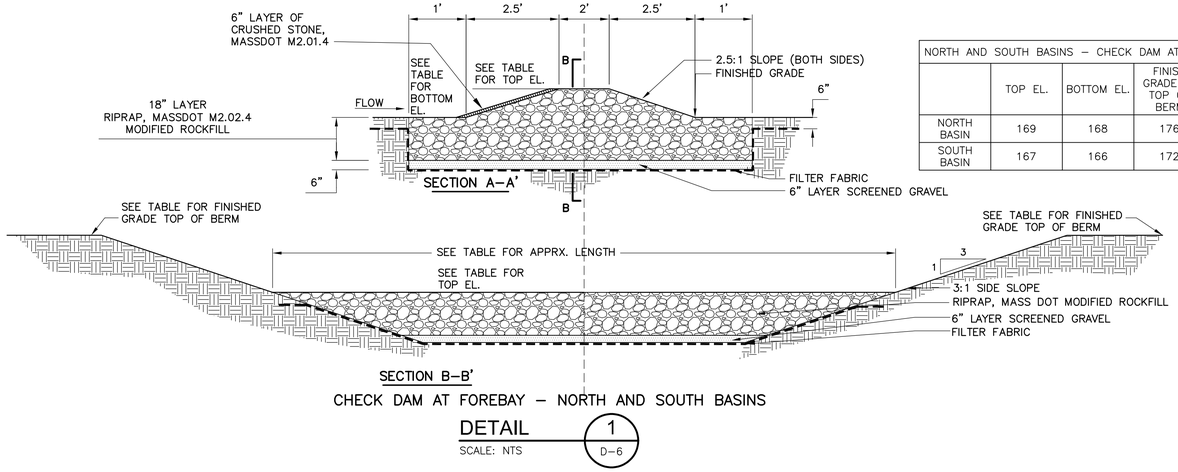
TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

STORMWATER DETAILS II

PROJECT NO. 0235-113811
FILE NAME: D005SWDT.DWG

SHEET NO.
D-5

RECORD DRAWING

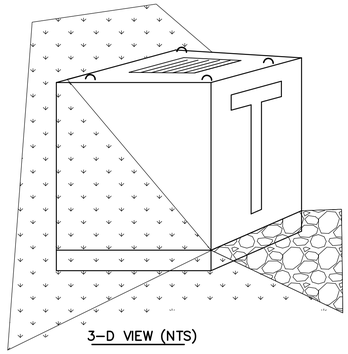


CHECK DAM AT FOREBAY – NORTH AND SOUTH BASINS

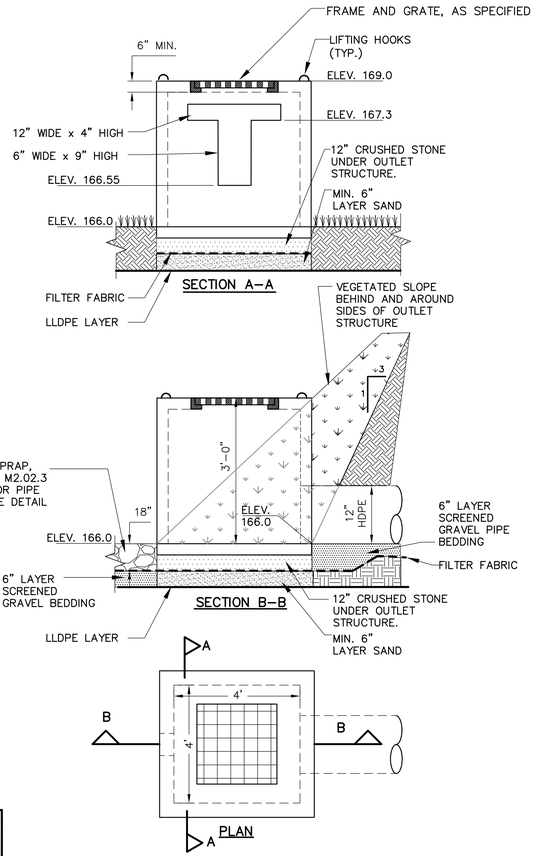
DETAIL 1 (D–6)

SCALE: NTS

NORTH AND SOUTH BASINS – CHECK DAM AT FOREBAY TABLE				
	TOP EL.	BOTTOM EL.	FINISH GRADE AT TOP OF BERM	APPROX. LENGTH
NORTH BASIN	169	168	176	38'–0"
SOUTH BASIN	167	166	172	44'–9"



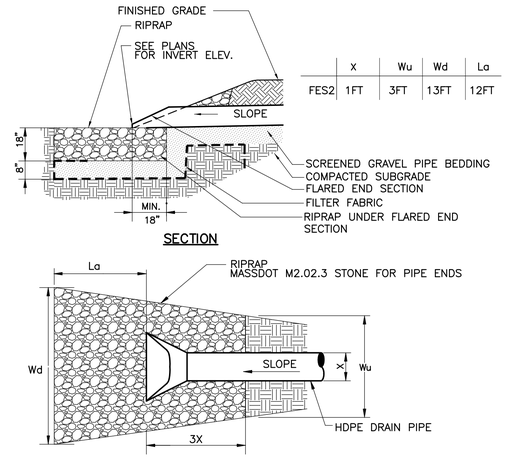
3–D VIEW (NTS)



PRECAST OUTLET CONTROL STRUCTURE – SOUTH BASIN

DETAIL 3 (D–6)

NOT TO SCALE

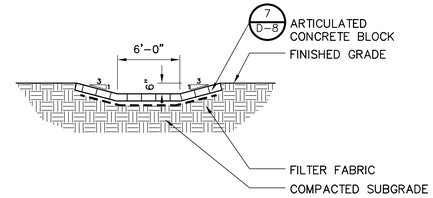


	X	Wu	Wd	La
FES2	1FT	3FT	13FT	12FT

FLARED END SECTION (F.E.S.) – SOUTH BASIN

DETAIL 2 (D–6)

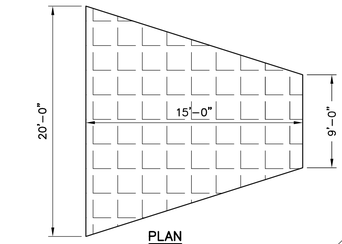
SCALE: NTS

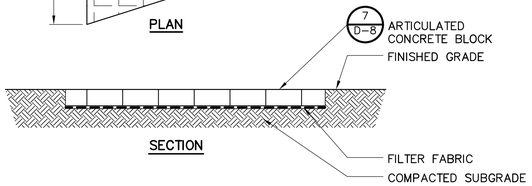


ARTICULATED CONCRETE BLOCK MAT CHANNEL

DETAIL 4 (D–6)

NOT TO SCALE

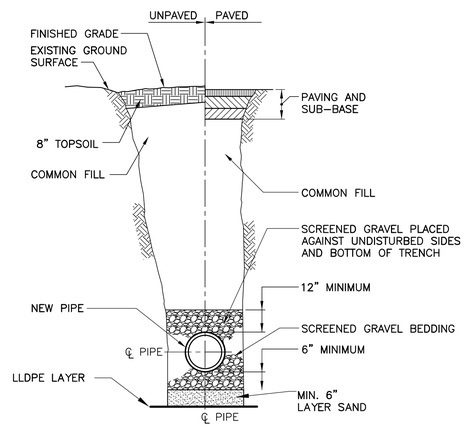




ARTICULATED CONCRETE BLOCK MAT PAD

DETAIL 5 (D–6)

NOT TO SCALE



TYPICAL TRENCH FOR HDPE PIPE

DETAIL 6 (D–6)

NOT TO SCALE

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By Nathan E Jones Date 10/30/2025

NATHAN JONES

CDM Smith

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3	3/2023	JRH	NEJ	UPDATED FOR BIDDING
2	11/2022	KAR	NEJ	REMOVED POST–CLOSURE USE / DPW MATERIALS HANDLING AREA
1	4/2017	JRH	NEJ	REVISED TO RESPOND TO CONSERVATON COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY: D. VELARDOCCHIA
DRAWN BY: J. HEIL
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

CDM Smith
75 State Street, Suite 701
Boston, MA 02109
Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

STORMWATER DETAILS III

PROJECT NO. 0235–113811
FILE NAME: D006SWDT.DWG

SHEET NO.
D-6

RECORD DRAWING

XREFs: [Wetland Survey Dwg – WSP 9.2.15, Final_Grading–Working, Full Site Survey Revised 5.11.16, C001GRPL, CDMS_2436, 20250328 andover sheet 3.liner, 20250328 ANDOVER. SHEET 1. CULVERT, 20250328 andover. sheet 2.subgrade, 20250328 ANDOVER. SHEET 4.FINAL GRADING] Images: []
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pw:\\cdmsmith-ap02-pw.bentley.com:pw_p11\0235\113811\04 Design Services NM_100%\02 Civil\10 CADD\2025 RECORD DRAWINGS\D006SWDTRD.dwg
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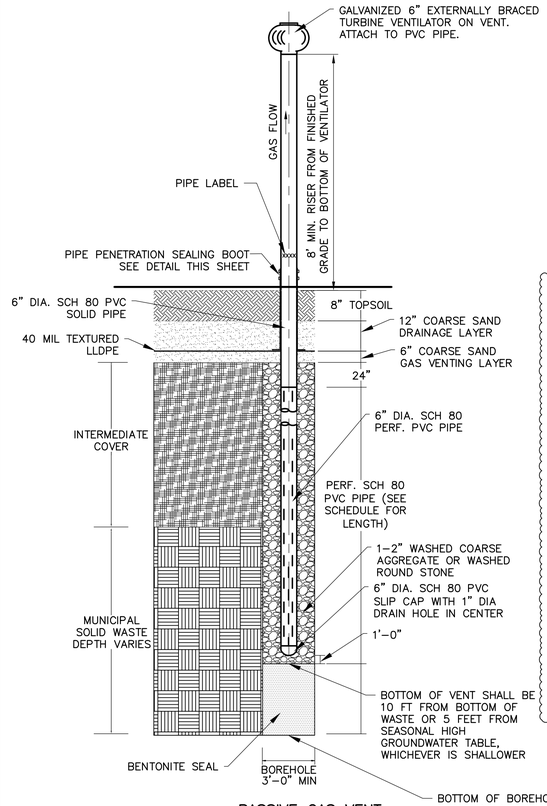

GALVANIZED 6" EXTERNALLY BRACED TURBINE VENTILATOR ON VENT. ATTACH TO PVC PIPE.
GAS FLOW
8' MIN. RISER FROM FINISHED GRADE TO BOTTOM OF VENTILATOR
PIPE LABEL
PIPE PENETRATION SEALING BOOT SEE DETAIL THIS SHEET
6" DIA. SCH 80 PVC SOLID PIPE
8" TOPSOIL
12" COARSE SAND DRAINAGE LAYER
40 MIL TEXTURED LLDPE
6" COARSE SAND GAS VENTING LAYER
24"
INTERMEDIATE COVER
6" DIA. SCH 80 PERF. PVC PIPE
PERF. SCH 80 PVC PIPE (SEE SCHEDULE FOR LENGTH)
1-2" WASHED COARSE AGGREGATE OR WASHED ROUND STONE
6" DIA. SCH 80 PVC SLIP CAP WITH 1" DIA DRAIN HOLE IN CENTER
1'-0"
MUNICIPAL SOLID WASTE DEPTH VARIES
BOTTOM OF VENT SHALL BE 10 FT FROM BOTTOM OF WASTE OR 5 FEET FROM SEASONAL HIGH GROUNDWATER TABLE, WHICHEVER IS SHALLOWER
BENTONITE SEAL
BOREHOLE 3'-0" MIN
BOTTOM OF BOREHOLE SHALL BE 4 FEET BELOW THE BOTTOM OF WASTE TO CONFIRM BOTTOM OF WASTE AS OBSERVED IN THE FIELD

PASSIVE GAS VENT

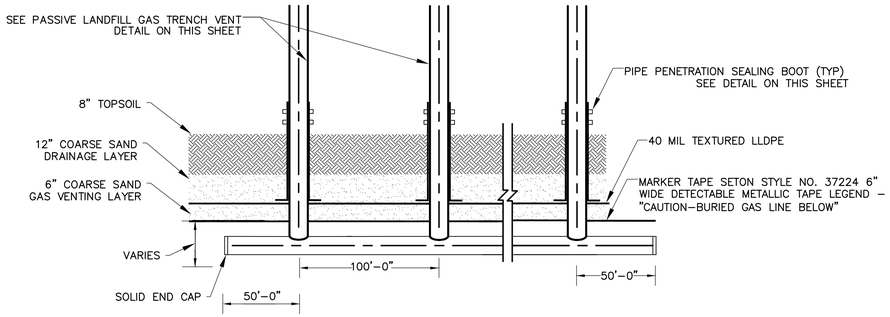
DETAIL 1 / D-7

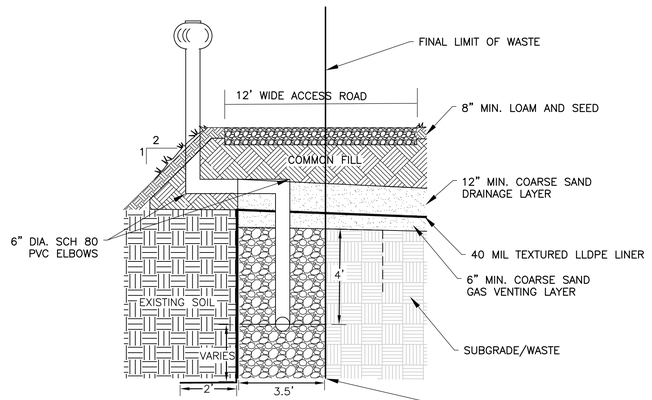
N.T.S.

PASSIVE GAS VENT SCHEDULE

VENT NO.	GROUND EL. (FT)	VENT BOTTOM EL. (FT)	PERF. PIPE LENGTH(FT)
1	171	162.1	5
2	182.1	162.9	15
3	189.0	163.8	21
4	193.6	162.4	27
5	166.2	153.0	9
6	188.0	164.8	19
7	181.3	169.1	8
8	175.7	166.5	5
9	185.2	167.0	14
10	192.9	164.7	24
11	177.2	168.0	5
12	183.9	168.7	11
13	173.2	168.0	21
14	200.4	170.3	26
15	202.0	168.8	29
16	198.9	175.7	19
17	198.7	172.5	22
18	186.4	171.2	11
19	196.7	173.5	19
20	205.5	174.3	27
21	207.4	180.2	23
22	192.2	173.0	15
23	194.2	184.0	6
24	197.2	187.0	6
25	198.6	189.4	5
26	199.0	189.8	5

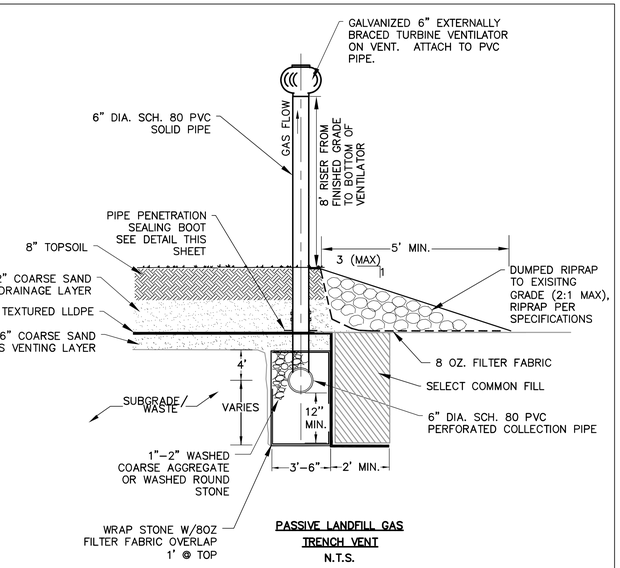
NOTE:
ALL ELEVATION ARE APPROXIMATE NGVD 1929.
ALL LENGTHS IN SCHEDULE FOR BIDDING PURPOSES ONLY


SEE PASSIVE LANDFILL GAS TRENCH VENT DETAIL ON THIS SHEET
PIPE PENETRATION SEALING BOOT (TYP) SEE DETAIL ON THIS SHEET
8" TOPSOIL
12" COARSE SAND DRAINAGE LAYER
6" COARSE SAND GAS VENTING LAYER
40 MIL TEXTURED LLDPE
MARKER TAPE SETON STYLE NO. 37224 6" WIDE DETECTABLE METALLIC TAPE LEGEND - "CAUTION-BURIED GAS LINE BELOW"
VARIES
SOLID END CAP
50'-0"
100'-0"
50'-0"


FINAL LIMIT OF WASTE
12' WIDE ACCESS ROAD
8" MIN. LOAM AND SEED
COMMON FILL
12" MIN. COARSE SAND DRAINAGE LAYER
6" DIA. SCH 80 PVC ELBOWS
40 MIL TEXTURED LLDPE LINER
6" MIN. COARSE SAND GAS VENTING LAYER
EXISTING SOIL
SUBGRADE/WASTE
VARIES
4'
2'
3.5'
BOTTOM OF TRENCH SHALL BE SEASONALLY LOW GROUNDWATER TABLE OR BEDROCK, WHICHEVER IS SHALLOWER, AS DETERMINED IN THE FIELD BY THE ENGINEER

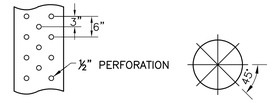
PASSIVE LANDFILL GAS TRENCH VENT WITH ELBOW

N.T.S.


GALVANIZED 6" EXTERNALLY BRACED TURBINE VENTILATOR ON VENT. ATTACH TO PVC PIPE.
6" DIA. SCH. 80 PVC SOLID PIPE
GAS FLOW
8' RISER FROM FINISHED GRADE TO BOTTOM OF VENTILATOR
PIPE PENETRATION SEALING BOOT SEE DETAIL THIS SHEET
8" TOPSOIL
5' MIN.
3 (MAX)
1
12" COARSE SAND DRAINAGE LAYER
40 MIL TEXTURED LLDPE
6" COARSE SAND GAS VENTING LAYER
DUMPED RIPRAP TO EXISITNG GRADE (2:1 MAX), RIPRAP PER SPECIFICATIONS
8 OZ. FILTER FABRIC
SELECT COMMON FILL
4'
SUBGRADE/ WASTE
VARIES
12" MIN.
6" DIA. SCH. 80 PVC PERFORATED COLLECTION PIPE
1"-2" WASHED COARSE AGGREGATE OR WASHED ROUND STONE
3'-6"
2' MIN.
WRAP STONE W/8OZ FILTER FABRIC OVERLAP 1' @ TOP

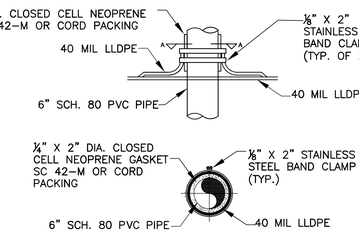
PASSIVE LANDFILL GAS TRENCH VENT

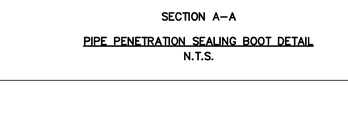
N.T.S.



HORIZONTAL GAS VENT PIPE PERFORATION DETAIL

N.T.S.


¼" X 2" DIA. CLOSED CELL NEOPRENE GASKET SC 42-M OR CORD PACKING
⅛" X 2" STAINLESS STEEL BAND CLAMP (TYP. OF 2)
40 MIL LLDPE
6" SCH. 80 PVC PIPE
A
A


¼" X 2" DIA. CLOSED CELL NEOPRENE GASKET SC 42-M OR CORD PACKING
⅛" X 2" STAINLESS STEEL BAND CLAMP (TYP.)
6" SCH. 80 PVC PIPE
40 MIL LLDPE

SECTION A-A

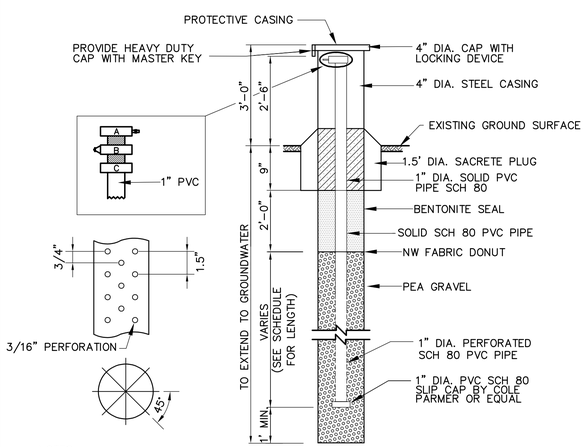
PIPE PENETRATION SEALING BOOT DETAIL

N.T.S.

HORIZONTAL GAS COLLECTION TRENCH

DETAIL 3 / D-7

N.T.S.



NOTES:
A. 1" MALE ADAPTER SCH 80 PVC, M&T PLASTICS INC. OR EQUAL.
B. 1" QUICK BALL VALVE, PVC. THREADED M&T PLASTICS INC. OR EQUAL.
C. 1.75" MALE ADAPTER ELBOW (1" MALE THREADED, 0.75 BARBED), HDPE COLE PARMER OR EQUAL.
D. 22 WELLS WILL BE INSTALLED IN LOCATIONS SHOWN ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER

LANDFILL GAS MONITORING WELL

DETAIL 2 / D-7

N.T.S.

LANDFILL GAS MONITORING WELL SCHEDULE

WELL NO.	GROUND EL. (FT)	BOTTOM EL. (FT)	PERF. PIPE LENGTH(FT)
LFG-1	160.8	154.8	3
LFG-2	163.9	256.9	4
LFG-3	165.9	158.9	4
LFG-4	167.0	160.0	4
LFG-5	168.0	161.0	4
LFG-6	170.0	163.0	4
LFG-7	171.0	164.0	4
LFG-8	–	–	–
LFG-9	169.9	163.9	3
LFG-10	170.0	163.0	4
LFG-11	170.0	162.0	5
LFG-12	171.0	164.0	4
LFG-13	175.2	167.2	5
LFG-14	182.0	172.0	7
LFG-15	188.1	180.1	5
LFG-16	190.5	182.5	5
LFG-17	191.0	183.0	5
LFG-18	192.5	184.5	5
LFG-19	194.5	186.5	5
LFG-20	196.0	188.0	5
LFG-21	194.2	182.2	9
LFG-22	189.0	180.0	6

NOTE:
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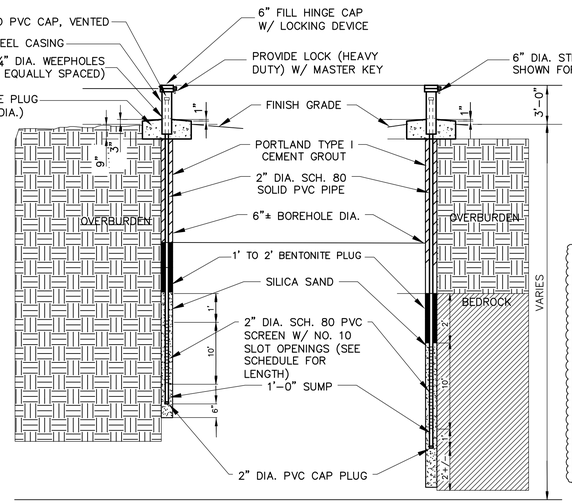

WELL CONSTRUCTED IN OVERBURDEN

WELL CONSTRUCTED IN BEDROCK

GROUNDWATER MONITORING WELL SCHEDULE

WELL NO.	GROUND EL. (FT)	BOTTOM EL. (FT)	SCREEN LENGTH(FT)
CDM-2SR	158	144	10
CDM-2MR	158	126	10
CDM-4SR	158	142	10
CDM-4DR	158	98	10
CDM-3SR	155	141	10
CDM-3MR	155	125	10
CDM-3DR	155	55	10
CDM-11SR	180	165	10
CDM-16S	157	143	10
CDM-17S	159	144	10
CDM-18S	158	136	10
PZ-1R	140	127	10

NOTE: ALL ELEVATION ARE APPROXIMATE NGVD 1929.

SUBTITLE

DETAIL # / DWG

SCALE

RECORD DRAWING

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By _____ Date 10/30/2025

NATHAN JONES

CDM Smith

REV. NO.	DATE	DRWN	CHKD	REMARKS
5	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
4	3/2023	JRH	NEJ	UPDATED FOR BIDDING
3	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE / DPW MATERIALS HANDLING AREA
2	1/2018	NEJ	ABM	REVISED TO RESPOND TO MASSDEP 12/14/2017 NOTICE OF TECHNICAL DEFICIENCY
1	6/2017	NEJ	AM	REVISED GROUNDWATER MONITORING WELL SCHEDULE

DESIGNED BY: E. SCHICK
DRAWN BY: E. SCHICK
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

CDM Smith
75 State Street, Suite 701
Boston, MA 02109
Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

ENVIRONMENTAL MONITORING AND LANDFILL GAS MANAGEMENT SYSTEM DETAILS

PROJECT NO. 0235-113811
FILE NAME: D007GMDT.DWG
SHEET NO. D-7

RECORD DRAWING

XREFs: [CDMS_2436, 20250328 andover sheet 3.liner, 20250328 ANDOVER. SHEET 1. CULVERT. 20250328 andover. sheet 2.subgrade. 20250328 ANDOVER. SHEET 4.FINAL GRADING] Images: []
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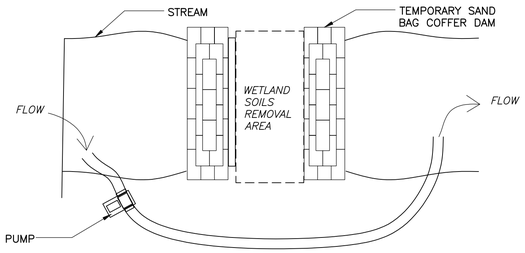


TEMPORARY COFFER DAM

DETAIL 1 / D-8

NOT TO SCALE

PLANT SCHEDULE					
SYMB.	COMMON NAME	LATIN NAME	CONTAINER	APP. HEIGHT	COUNT
PS	EASTERN WHITE PINE	PINUS STROBUS		8'–10'	10
QR	NORTHERN RED OAK	QUERCUS RUBRA	2.0–2.5" CALIPER		7
SN	COMMON ELDERBERRY	SAMBUCUS NIGRA	#2		2

MASTER PLANT SCHEDULE

DETAIL 2 / D-8

NOT TO SCALE

WETLAND RESTORATION PLANT SCHEDULE								
SYMB.	COMMON NAME	LATIN NAME	CONTAINER	APP. HEIGHT	COUNT	MIN. SPACING	STRATEGY	CONDITION
AR	RED MAPLE	ACER RUBRUM	2.5" MIN. CALIPER	5'–6'		SPACE 15–FT OC	INDIVIDUAL	B&B
CA	SILKY DOGWOOD	CORNUS AMOMUM	#2	4'–5'		SPACE 10–FT OC	GROUPS OF 3	CONT.
NS	BLACKGUM	NYSSA SYLVATICA	2.5" MIN. CALIPER	5'–6'		SPACE 15–FT OC	INDIVIDUAL	B&B
IV	WINTERBERRY	ILEX VERTICILLATA	#2	4'–5'		SPACE 10–FT OC	GROUPS OF 3	CONT.
LB	SPICEBUSH	LONICERA BENZOIN	#2	4'–5'		SPACE 10–FT OC	GROUPS OF 3	CONT.
VR	NORTHERN ARROWWOOD	VIBURNUM RECOGNITUM	#2	4'–5'		SPACE 10–FT OC	GROUPS OF 3	CONT.
VC	HIGHBUSH BLUEBERRY	VACCINIUM CORYMBOSUM	#2	4'–5'		SPACE 10–FT OC	GROUPS OF 3	CONT.

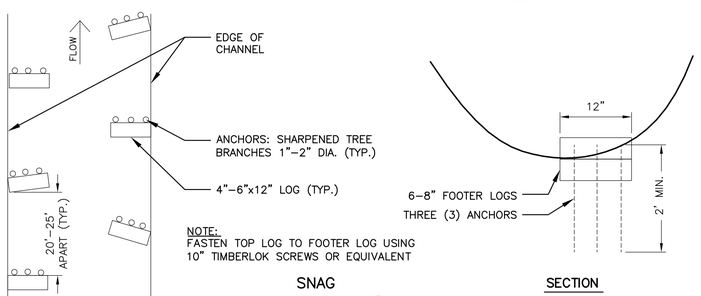
NOTES:

1. WETLAND RESTORATION – PLANT 194 TREES PER ACRE AT APPROX. 15 FT. ON CENTER IN A RANDOM PATTERN. PLANT 400 SHRUBS PER ACRE APPROX. 10 FT. ON CENTER IN GROUPS OF 3 IN A RANDOM PATTERN.
2. AFTER PLANTING TREES AND SHRUBS, SOW WITH NEW ENGLAND WETLAND PLANTS INC., NEW ENGLAND WETMIX, OR EQUAL, AT A RATE OF 11 LB/2,500 SF AND IN ACCORDANCE WITH SECTION 02955. NEW ENGLAND WETMIX SHALL BE PLANTED FROM MID–MAY TO MID–JUNE UNLESS THE SOILS REMAIN MOIST OR WET THROUGH THE SUMMER, THEN CAN BE APPLIED UNTIL AUGUST 15. SOWING DURING SUMMER MONTHS REQUIRE SUPPLEMENTAL WATERING AND A LIGHT MULCH OF CLEAN, WEED FREE STRAW.
3. PLANT/SEED SUPPLIERS:
   A. NEW ENGLAND WETLAND PLANTS INC.
      820 WEST STREET, AMHERST, MA 01002
      PH. 413–548–8000
   B. BIGELOW NURSERIES
      455 WEST MAIN STREET, P.O. BOX 718
      NORTHBORO, MA 01532
   C. OR APPROVED EQUAL.

WETLAND RESTORATION PLANTING

DETAIL 3 / D-8

NOT TO SCALE

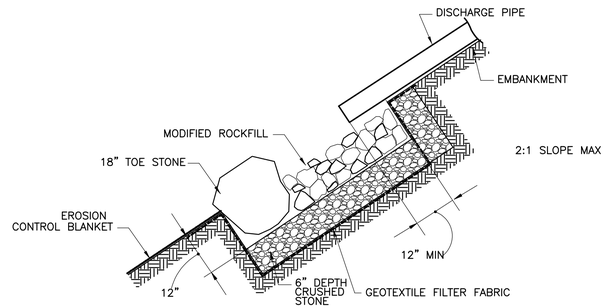


PLAN SECTION

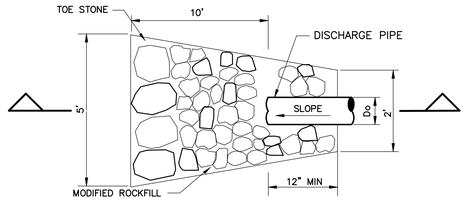
SNAG

DETAIL 8 / D-8

NOT TO SCALE



SECTION

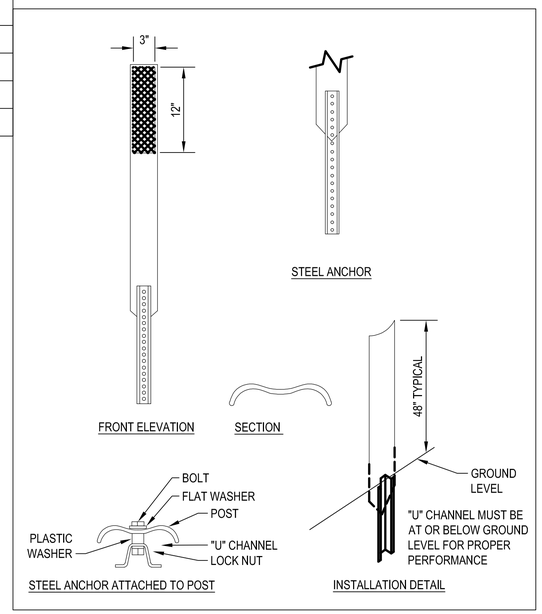


PLAN

DIVERSION DISCHARGE POINT

DETAIL 4 / D-8

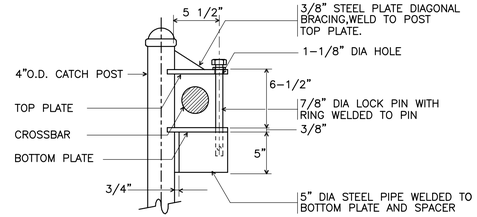
NOT TO SCALE



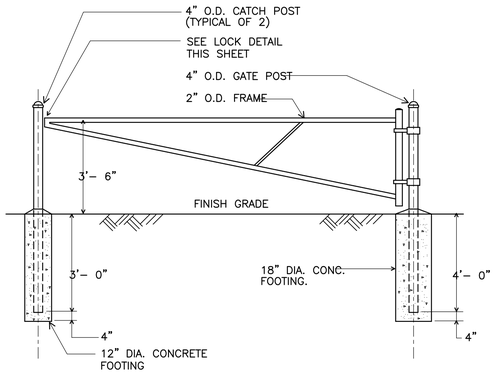
ROADSIDE DELINEATOR POST

DETAIL 5 / D-8

NOT TO SCALE



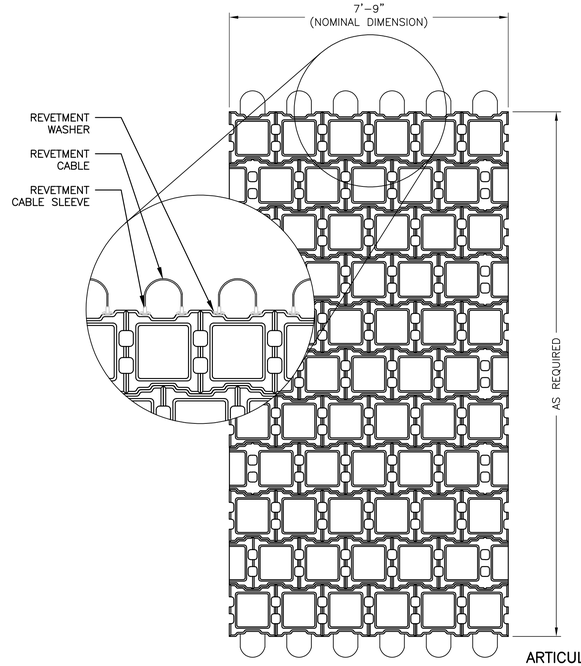
LOCK POST AND LOCKING ASSEMBLY



VEHICLE CONTROL GATE

DETAIL 6 / D-8

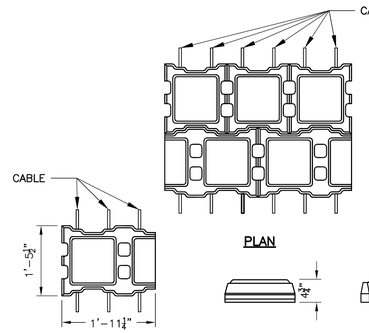
NOT TO SCALE

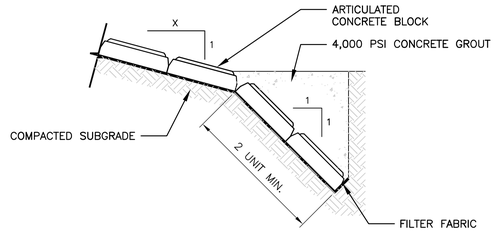


ARTICULATED CONCRETE BLOCK MAT

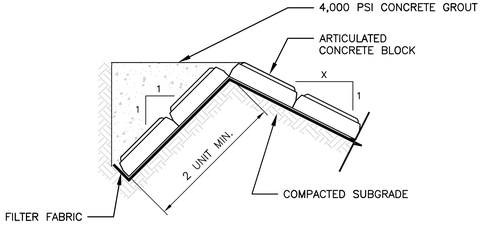
DETAIL 7 / D-8

NOT TO SCALE

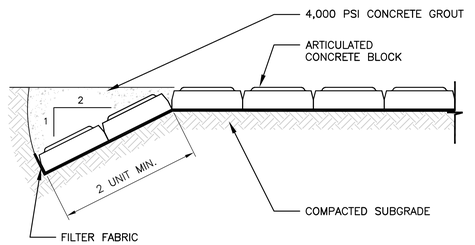




BOTTOM TOE–IN SLOPE



TOP TOE–IN DETAIL



SIDE SLOPE TOE–IN DETAIL

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By Nathan E Jones Date 10/30/2025

NATHAN JONES

CDM Smith

REV. NO.	DATE	DRWN	CHKD	REMARKS
3	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
2	3/2023	JRH	NEJ	UPDATED FOR BIDDING
1	11/2022	KAR	NEJ	REMOVED POST–CLOSURE USE / DPW MATERIALS HANDLING AREA

DESIGNED BY: G. HOWARD
DRAWN BY: J. HEIL
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

CDM Smith
75 State Street, Suite 701
Boston, MA 02109
Tel. (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

MISCELLANEOUS DETAILS

PROJECT NO. 0235–113811
FILE NAME: D008MISC.DWG

SHEET NO. D-8

RECORD DRAWING

XREFs: [CDMS_2436] Images: []
Last saved by: YOUNGCK Time: 10/14/2025 3:29:12 PM
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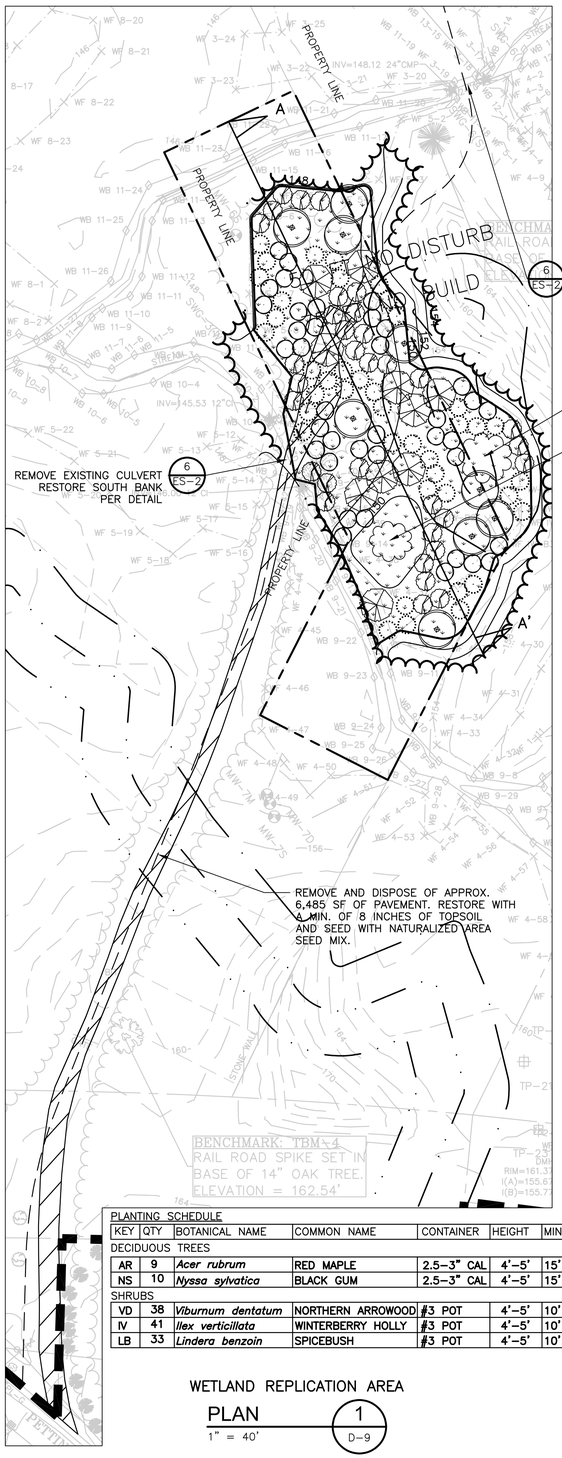


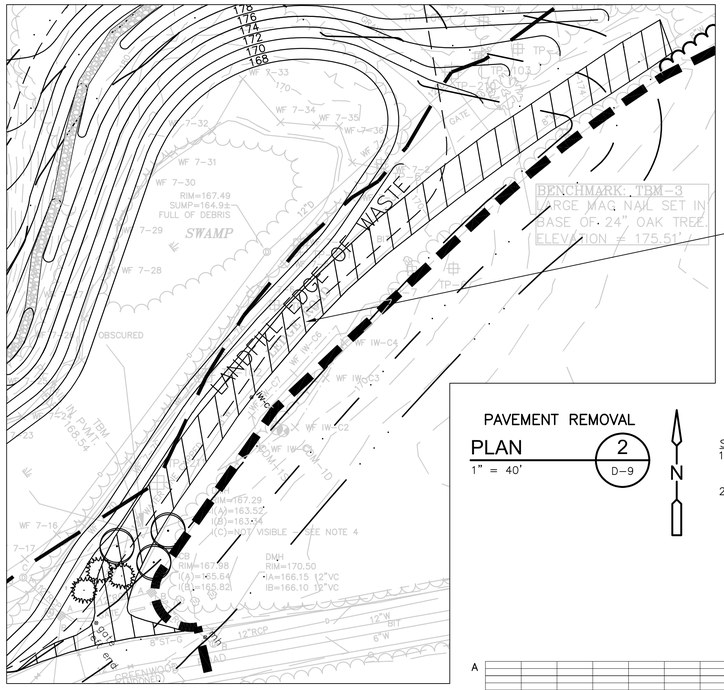
REMOVE EXISTING CULVERT
RESTORE SOUTH BANK
PER DETAIL
6 / ES-2

REMOVE AND DISPOSE OF APPROX. 6,485 SF OF PAVEMENT. RESTORE WITH A MIN. OF 8 INCHES OF TOPSOIL AND SEED WITH NATURALIZED AREA SEED MIX.

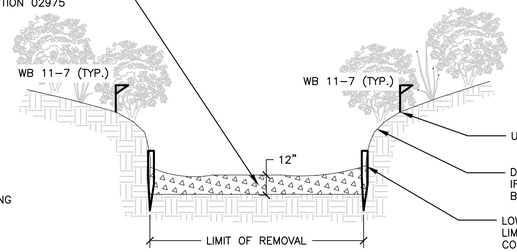
REMOVE EXISTING CULVERT
RESTORE STREAM CHANNEL TO MATCH
ADJACENT STREAM CHANNEL GRADES USING
6" COMMON FILL AND 6" STREAMBED
MATERIAL PER SPEC. SECTION 02975
RESTORE BANKS PER DETAIL
6 / ES-2

PROTECT EXISTING 30-IN DBH
RED MAPLE (ACER RUBRUM)

PROTECT EXISTING 14-IN DBH
RED OAK (QUERCUS RUBRA)



REMOVE ARSENIC-IMPACTED WETLAND SOIL FROM INTERMITTENT STREAM CHANNEL BOTTOM, RESTORE INTERMITTENT STREAM CHANNEL TO PRE-CONSTRUCTION GRADES USING 6" OF COMMON FILL AND 6" OF STREAMBED MATERIAL PER SPEC. SECTION 02975



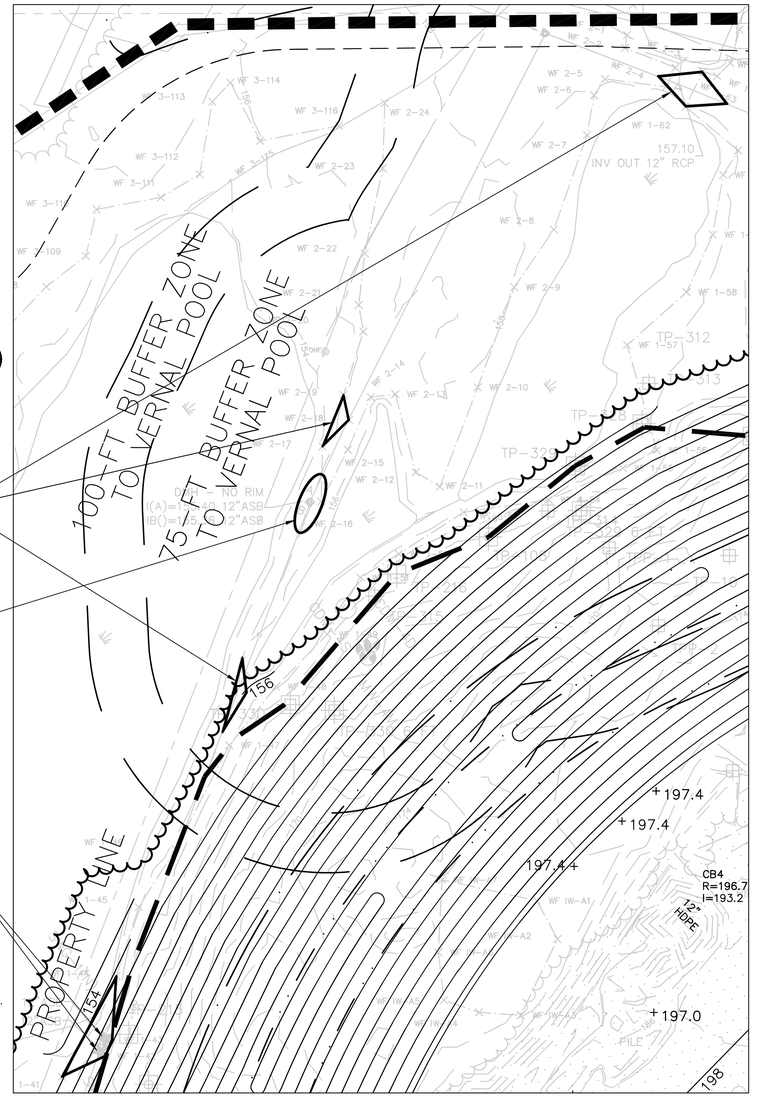
UPPER LIMIT OF BANK (WB FLAGS)

DO NOT DISTURB BANK
IF BANK SLUMPS DUE TO EXCAVATION OF CHANNEL BOTTOM, RESTORE PER DETAIL 6 ON SHEET ES-2
6 / ES-2

LOWER LIMIT OF BANK/LIMIT OF EXCAVATION LIMITS SHOWN ON DRAWINGS APPROXIMATE. CONTRACTOR TO STAKE LIMITS IN FIELD FOR ENGINEER'S APPROVAL PRIOR TO MOBILIZING. LIMIT SHALL BE BASED ON OBSERVED TOE OF SLOPE. EXCAVATION SHALL NOT COMMENCE UNTIL WRITTEN APPROVAL OF STAKED LIMITS IS RECEIVED FROM ENGINEER. ONCE LIMITS APPROVED, SURVEY STAKES.

INTERMITTENT STREAM WETLAND SOIL REMOVAL
DETAIL 1 / D-9
NOT TO SCALE

NOTES:
1. CONSTRUCTION OF REPLICATION SHALL NOT COMMENCE UNTIL WETLAND SOIL REMEDIATION IS COMPLETE.
2. PREPARE SUBGRADE BY REMOVING SOIL WITHIN REPLICATION AREA GRADING LIMITS TO 12-INCHES BELOW PROPOSED GRADES.
3. INSTALL 12-INCHES HIGH ORGANIC CONTENT LOAM PRIOR TO PLANTINGS.
4. SEED ENTIRE REPLICATION AREAS WITH WETLAND SEED MIX.



RESTORE ERODED BANK WHERE UNDERDRAIN IS EXPOSED WITH MIN. 12" LAYER HIGH ORGANIC CONTENT LOAM AND SEED WITH WETLAND SEED MIXTURE (160 SF). COVER WITH BIODEGRADABLE EROSION CONTROL BLANKET

REMOVE AND DISPOSE OF DMH AND RESTORE ERODED BANK WHERE EXPOSED WITH MIN. 12" LAYER HIGH ORGANIC CONTENT LOAM AND SEED WITH WETLAND SEED MIXTURE (200 SF). COVER WITH BIODEGRADABLE EROSION CONTROL BLANKET

REMOVE AND RECYCLE APPROX. 9,520 SF OF PAVEMENT. RESTORE WITH A MIN. OF 6 INCHES OF TOPSOIL AND SEED WITH NATURAL AREA SEED MIXTURE

REMOVE OUTFALLS AND RESTORE ERODED BANK WHERE EXPOSED WITH MIN. 12" LAYER HIGH ORGANIC CONTENT LOAM AND SEED WITH WETLAND SEED MIXTURE (100 SF). COVER WITH BIODEGRADABLE EROSION CONTROL BLANKET

PAVEMENT REMOVAL
PLAN 2 / D-9
1" = 40'

N

SEED MIX NOTES:
1. WETLAND SEED MIXTURE SHALL BE NEW ENGLAND WETMIX BY NEW ENGLAND WETLAND PLANTS, INC. OR APPROVED EQUAL.
2. NATURAL AREA SEED MIX AND PROPORTIONS:

% BY WT.	COMMON NAME
40	CLEMFINE, REBEL II, OR TRIBUTE TALL FESCUE
15	PALMER II PERENNIAL RYEGRASS
10	JAMESTOWN CHEWINGS FESCUE
10	RELIANT HARD FESCUE
10	BIRDSFOOT TREFOIL (ARVENIS VARIETY)
5	SWITCHGRASS
5	WHITE CLOVER
5	REDTOP (STREAKER VARIETY)

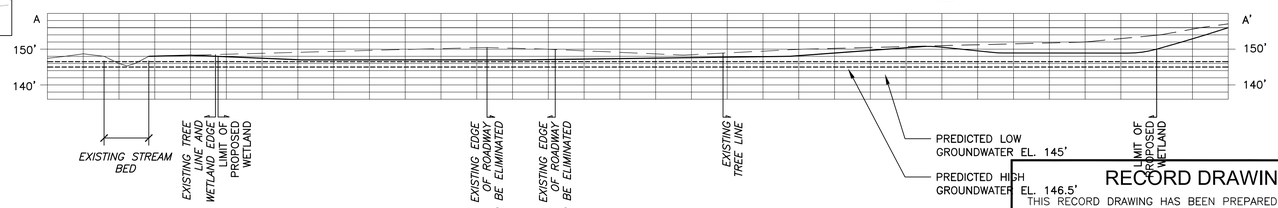
BVW BANK RESTORATION
PLAN 3 / D-9
1" = 30'

PLANTING SCHEDULE

KEY	QTY	BOTANICAL NAME	COMMON NAME	CONTAINER	HEIGHT	MIN. SPACING	STRATEGY	CONDITION
DECIDUOUS TREES								
AR	9	*Acer rubrum*	RED MAPLE	2.5-3" CAL	4'-5'	15' O.C.	INDIVIDUAL	B&B
NS	10	*Nyssa sylvatica*	BLACK GUM	2.5-3" CAL	4'-5'	15' O.C.	INDIVIDUAL	B&B
SHRUBS								
VD	38	*Viburnum dentatum*	NORTHERN ARROWOOD	#3 POT	4'-5'	10' O.C.	GROUPS OF 3	CONT.
IV	41	*Ilex verticillata*	WINTERBERRY HOLLY	#3 POT	4'-5'	10' O.C.	GROUPS OF 3	CONT.
LB	33	*Lindera benzoin*	SPICEBUSH	#3 POT	4'-5'	10' O.C.	GROUPS OF 3	CONT.

LEGEND
AR
NS
VD
IV
LB

WETLAND REPLICATION AREA
PLAN 1 / D-9
1" = 40'



WETLAND REPLICATION AREA
SECTION A-A' / D-9
1"=20'

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By _____ Date 10/30/2025
NATHAN JONES
CDM Smith

REV. NO.	DATE	DRWN	CHKD	REMARKS
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4	3/2023	JRH	NEJ	UPDATED FOR BIDDING
3	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE / DPW MATERIALS HANDLING AREA
2	11/2017	NEJ	MHL	REVISED REPLICATION AREA TO REMOVE BIFURCATION PER MASSDEP WETLANDS REQUEST
1	3/2017	NEJ	MHL	REVISED TO RESPOND TO CONSERVATION COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY: M. LOFSTEDT
DRAWN BY: J. HEIL
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

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75 State Street, Suite 701
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TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

WETLAND REPLICATION PLAN AND SECTION

PROJECT NO. 0235-113811
FILE NAME: D009WETL.DWG
SHEET NO. D-9

RECORD DRAWING

XREFs: [Full Site Survey Revised 5.11.16, C001BSPL-REV-NOV2017, CDMS_2436, 20250328 andover sheet 3.iner, 20250328 ANDOVER. SHEET 1. CULVERT, 20250328 andover. sheet 2.subgrade, 20250328 ANDOVER. SHEET 4.FINAL GRADING] Images: []
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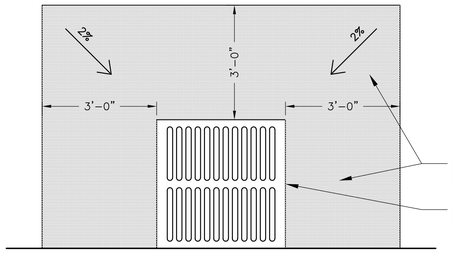
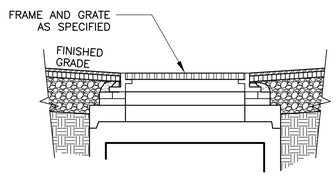


PLAN

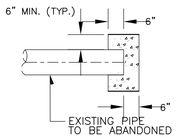


SECTION

CATCH BASIN APRON

DETAIL 1 / D-10

NOT TO SCALE



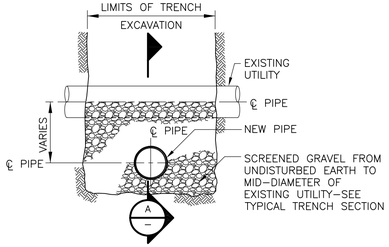
NOTE:

1. IF PIPE TO BE ABANDONED IS GREATER THAN 12-INCHES IN DIAMETER, FILL WITH FLOWABLE FILL OR GROUT

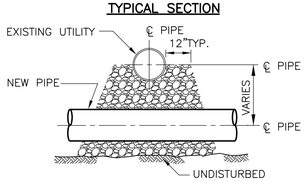
CONCRETE PLUG FOR ABANDONED PIPE

DETAIL 2 / D-10

NOT TO SCALE



TYPICAL SECTION

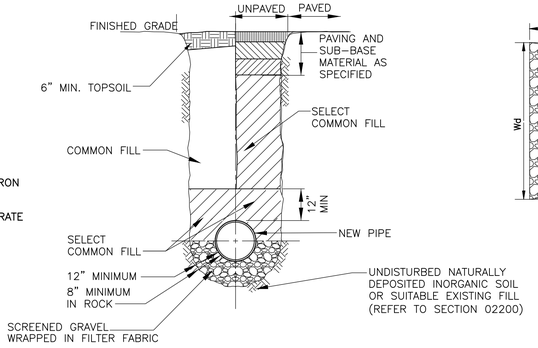


SECTION A-A

EXISTING UTILITY CROSSING

DETAIL 3 / D-10

NOT TO SCALE



NOTES:

1. FILTER FABRIC SHALL BE PLACED BETWEEN UNDISTURBED EARTH AND SCREENED GRAVEL WHERE TRENCH EXCAVATION EXTENDS BELOW THE GROUNDWATER LEVEL.

2. IN UNSUITABLE SUBGRADES, EXCAVATE TO THE TOP OF NATURALLY DEPOSITED SUITABLE MATERIAL TO A MAXIMUM OF 4-FT BELOW THE PIPE INVERT AND REPLACE WITH COMPACTED STRUCTURAL FILL WRAPPED IN FILTER FABRIC.

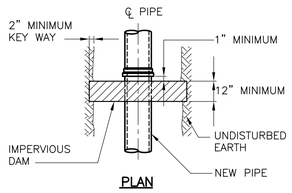
3. REFER TO SPECIFICATION SECTION 02200 FOR COMPACTION REQUIREMENTS AND TO SECTION 02230 FOR GRADATIONS OF BACKFILL MATERIAL.

4. PROVIDE AT LEAST ONE IMPERVIOUS DAM IN GRAVEL BEDDING BETWEEN EACH MANHOLE OR EVERY 300 FT., WHICHEVER IS LESS. SEE DETAIL THIS SHEET.

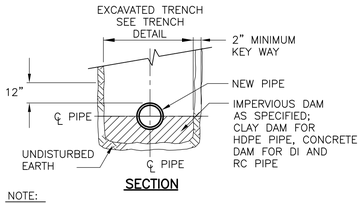
TYPICAL TRENCH DETAIL FOR DI AND RCP PIPE

DETAIL 4 / D-10

NOT TO SCALE



PLAN


EXCAVATED TRENCH SEE TRENCH DETAIL
2" MINIMUM KEY WAY
12"
NEW PIPE
℄ PIPE
IMPERVIOUS DAM AS SPECIFIED; CLAY DAM FOR HDPE PIPE, CONCRETE DAM FOR DI AND RC PIPE
UNDISTURBED EARTH
℄ PIPE

SECTION

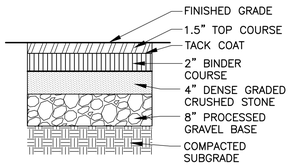
NOTE:

1. TOP OF DAM TO BE AT MID-DIAMETER OF PIPE.

PIPE TRENCH DAM DETAIL

DETAIL 5 / D-10

NOT TO SCALE

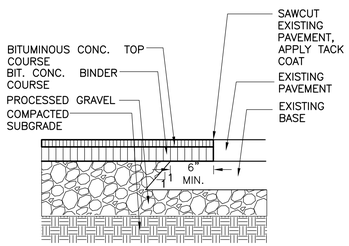


BIT. CONC. PAVEMENT FOR PUBLIC ROADS

DETAIL 6 / D-10

NOT TO SCALE

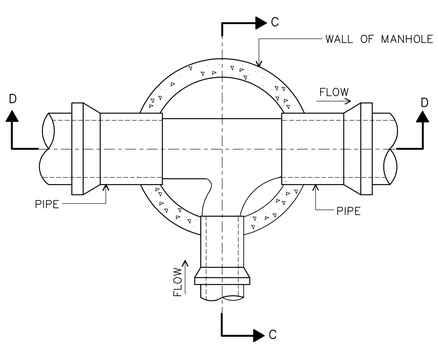
1.) BASE COURSE SHALL EXTEND 3" MIN. BEYOND EDGE OF PAVEMENT



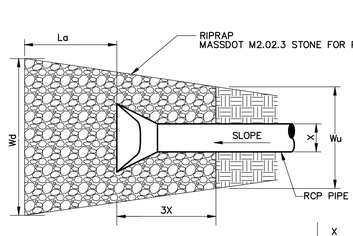
PAVEMENT MATCH FOR PUBLIC ROADS

DETAIL 7 / D-10

NOT TO SCALE

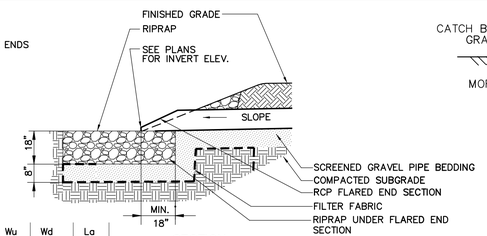


PLAN



PLAN

	X	Wu	Wd	La
FES1	1.5FT	5FT	18FT	17FT

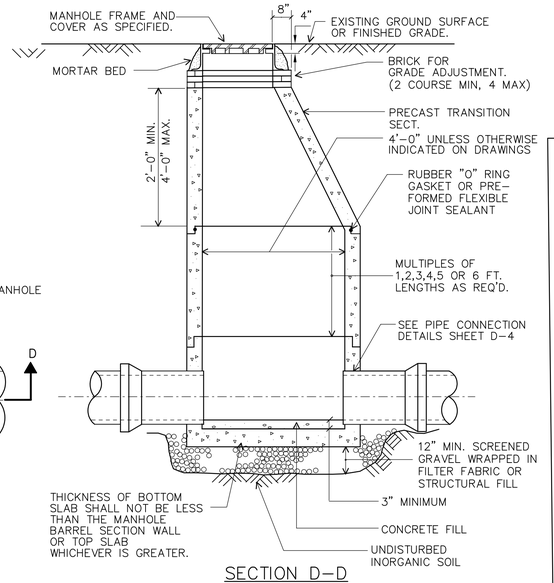


SECTION

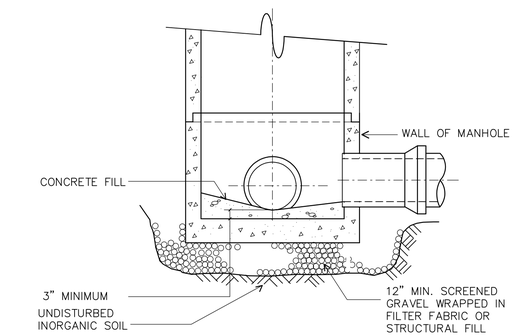
FLARED END SECTION (F.E.S.)

DETAIL 11 / D-10

SCALE: NTS


MANHOLE FRAME AND COVER AS SPECIFIED.
8"
4"
EXISTING GROUND SURFACE OR FINISHED GRADE.
MORTAR BED
BRICK FOR GRADE ADJUSTMENT. (2 COURSE MIN, 4 MAX)
2'-0" MIN. 4'-0" MAX.
PRECAST TRANSITION SECT.
4'-0" UNLESS OTHERWISE INDICATED ON DRAWINGS
RUBBER "O" RING GASKET OR PRE-FORMED FLEXIBLE JOINT SEALANT
MULTIPLES OF 1,2,3,4,5 OR 6 FT. LENGTHS AS REQ'D.
SEE PIPE CONNECTION DETAILS SHEET D-4
12" MIN. SCREENED GRAVEL WRAPPED IN FILTER FABRIC OR STRUCTURAL FILL
3" MINIMUM
CONCRETE FILL
UNDISTURBED INORGANIC SOIL
THICKNESS OF BOTTOM SLAB SHALL NOT BE LESS THAN THE MANHOLE BARREL SECTION WALL OR TOP SLAB WHICHEVER IS GREATER.

SECTION D-D

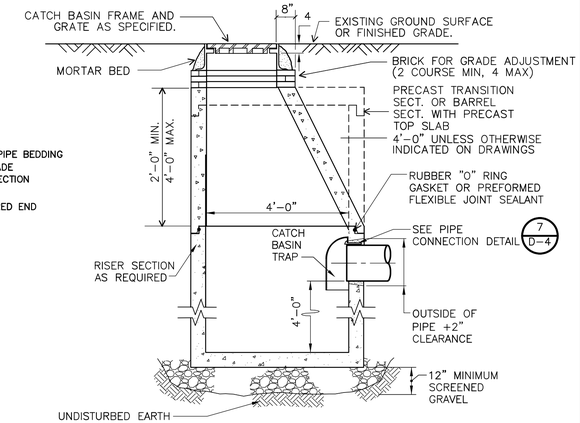

WALL OF MANHOLE
CONCRETE FILL
3" MINIMUM
UNDISTURBED INORGANIC SOIL
12" MIN. SCREENED GRAVEL WRAPPED IN FILTER FABRIC OR STRUCTURAL FILL

SECTION C-C

TYPICAL PRECAST DRAIN MANHOLE FOR GREENWOOD ROAD

DETAIL 8 / D-10

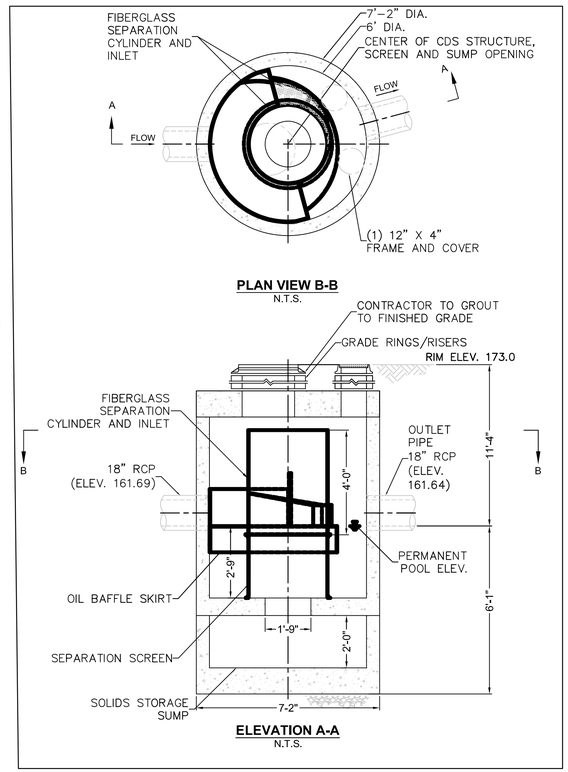
NOT TO SCALE


CATCH BASIN FRAME AND GRATE AS SPECIFIED.
8"
4
EXISTING GROUND SURFACE OR FINISHED GRADE.
MORTAR BED
BRICK FOR GRADE ADJUSTMENT (2 COURSE MIN, 4 MAX)
PRECAST TRANSITION SECT. OR BARREL SECT. WITH PRECAST TOP SLAB
2'-0" MIN. 4'-0" MAX.
4'-0" UNLESS OTHERWISE INDICATED ON DRAWINGS
RUBBER "O" RING GASKET OR PREFORMED FLEXIBLE JOINT SEALANT
4'-0"
CATCH BASIN TRAP
SEE PIPE CONNECTION DETAIL 7 / D-4
RISER SECTION AS REQUIRED
4'-0"
OUTSIDE OF PIPE +2" CLEARANCE
12" MINIMUM SCREENED GRAVEL
UNDISTURBED EARTH

PRECAST DEEP SUMP CATCH BASIN FOR GREENWOOD ROAD

DETAIL 9 / D-10

NOT TO SCALE



INLINE PROPRIETARY SEPARATOR UNIT-GREENWOOD ROAD

DETAIL 10 / D-10

SCALE: NTS

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By NATHAN JONES Date 10/30/2025

CDM Smith

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DESIGNED BY: D. VELARDOCCHIA
DRAWN BY: J. HEIL
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

CDM Smith
75 State Street, Suite 701
Boston, MA 02109
Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

GREENWOOD ROAD STORM DRAIN DETAILS

PROJECT NO. 0235-113811
FILE NAME: D010SDDT.DWG
SHEET NO. D-10

RECORD DRAWING

XREFs: [Wetland Survey Dwg - WSP 9.2.15, Final_Grading-Working, Full Site Survey Revised 5.11.16, C001GRPL, CDMS_2436, 20250328 andover sheet 3.liner, 20250328 ANDOVER. SHEET 1. CULVERT, 20250328 andover. sheet 2.subgrade, 20250328 ANDOVER. SHEET 4.FINAL GRADING] Images: []
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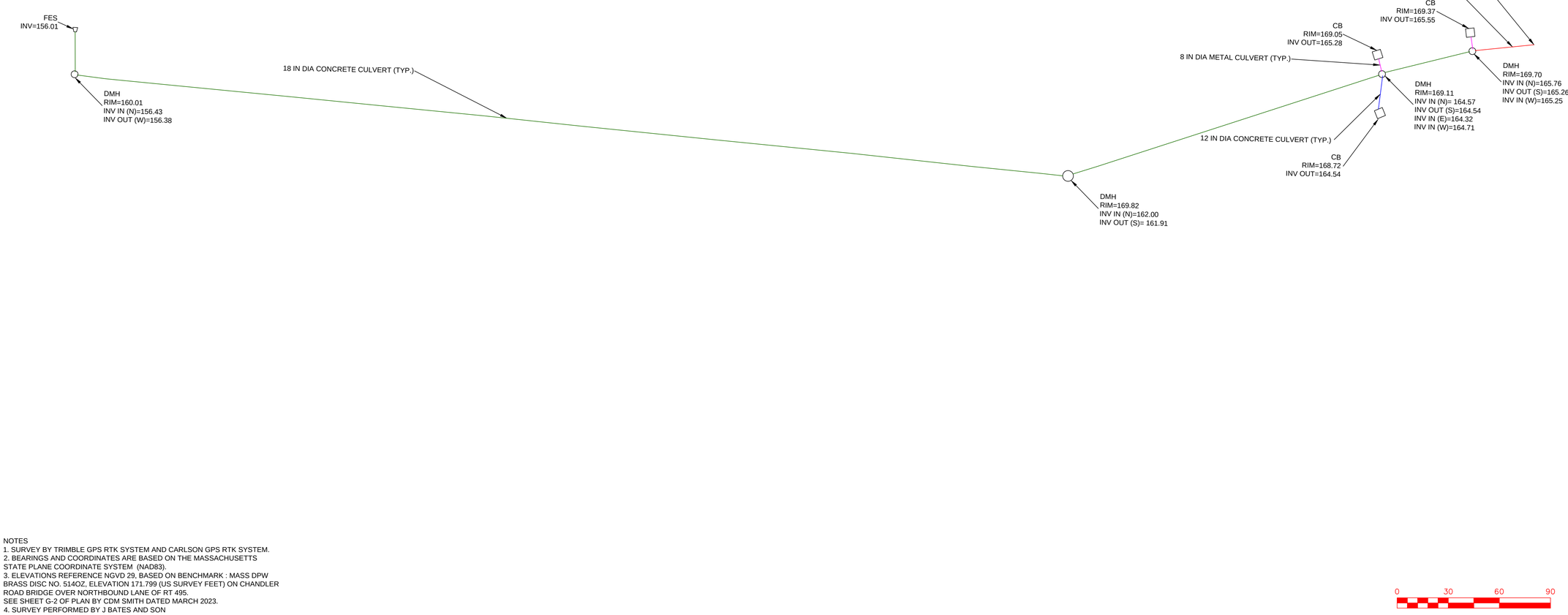
LEGEND

- 18 IN DIA CONCRETE CULVERT
- 15 IN DIA CONCRETE CULVERT
- 12 IN DIA CONCRETE CULVERT
- 8 IN DIA METAL CULVERT



NOTES
1. SURVEY BY TRIMBLE GPS RTK SYSTEM AND CARLSON GPS RTK SYSTEM.
2. BEARINGS AND COORDINATES ARE BASED ON THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM (NAD83).
3. ELEVATIONS REFERENCE NGVD 29, BASED ON BENCHMARK : MASS DPW BRASS DISC NO. 514OZ, ELEVATION 171.799 (US SURVEY FEET) ON CHANDLER ROAD BRIDGE OVER NORTHBOUND LANE OF RT 495.
SEE SHEET G-2 OF PLAN BY CDM SMITH DATED MARCH 2023.
4. SURVEY PERFORMED BY J BATES AND SON

PREPARED BY:

J Bates and Son, LLC
57 LAWRENCE STREET
CLINTON MA, 01510
(978) 368-7001

PREPARED FOR:

TOWN OF ANDOVER
36 BARTLET STREET

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

DRAINAGE ASBUILT

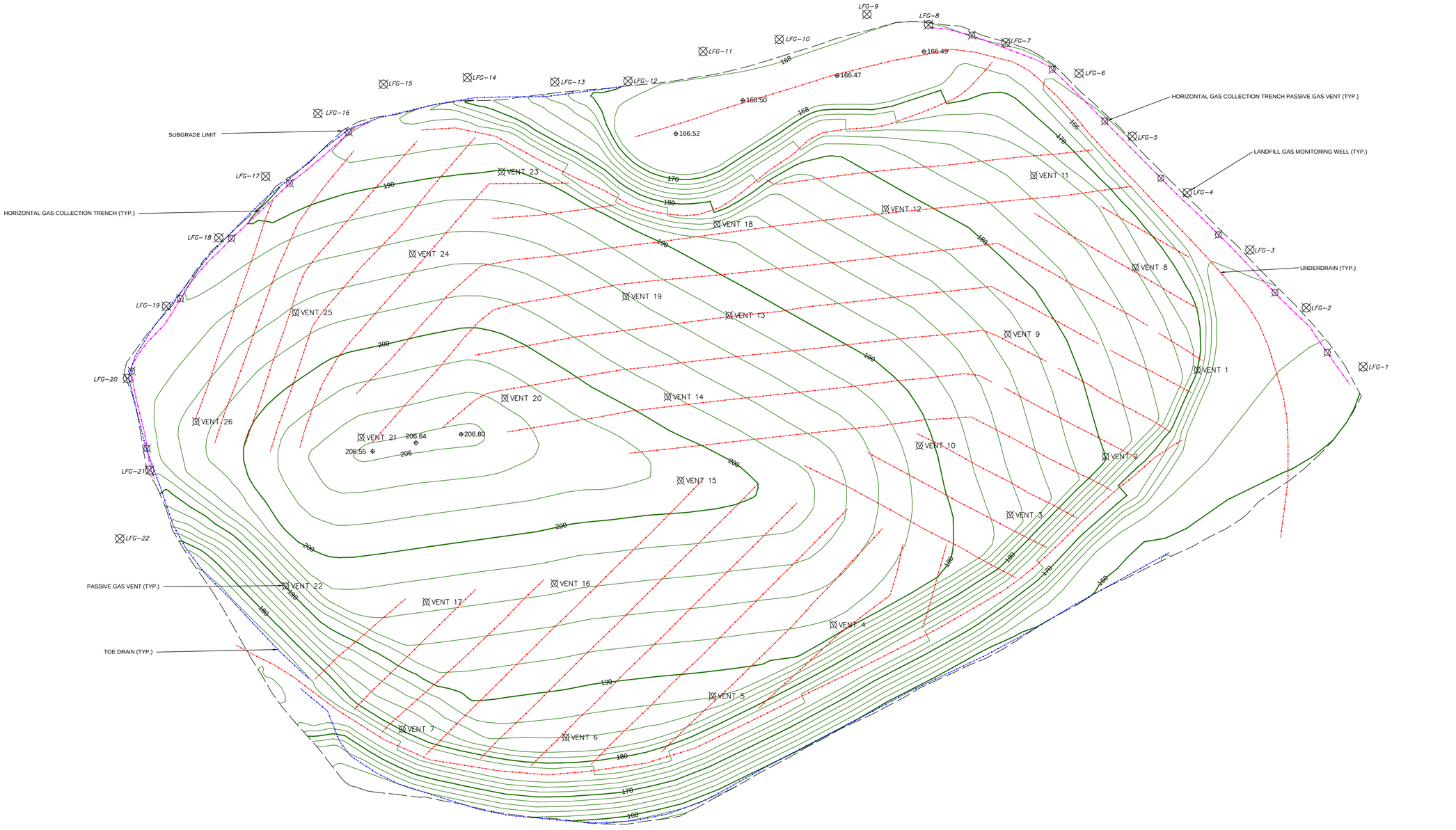
SURVEY BY: RSB, AJ
COMPUTATIONS BY: RSB
DRAFTING BY: RSB

SCALE 1" = 30'

DATE: 03-28-2025

LEGEND

- 180 — MAJOR CONTOUR
- MINOR CONTOUR
- LIMIT OF SUBGRADE
- UNDERDRAIN
- TOE DRAIN
- HORIZONTAL GAS COLLECTION TRENCH
- VENT 21 — HORIZONTAL GAS COLLECTION TRENCH PASSIVE GAS VENT
- PASSIVE GAS VENT
- ⊕206.55 — SUBGRADE SPOT ELEVATION



NOTES
1. SURVEY BY TRIMBLE GPS RTK SYSTEM AND PROPELLER DRONE SYSTEM.
2. BEARINGS AND COORDINATES ARE BASED ON THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM (NAD83).
3. ELEVATIONS REFERENCE NGVD 29, BASED ON BENCHMARK : MASS DPW BRASS DISC NO. 5140Z, ELEVATION 171.799 (US SURVEY FEET) ON CHANDLER ROAD BRIDGE OVER NORTHBOUND LANE OF RT 495.
SEE SHEET G-2 OF PLAN BY CDM SMITH DATED MARCH 2023.
4. SURVEY PERFORMED BY J BATES AND SON.
5. CONTOURS REPRESENT SUBGRADE.

PREPARED BY:

J Bates and Son, LLC
57 LAWRENCE STREET
CLINTON MA, 01510
(978) 368-7001

PREPARED FOR:

TOWN OF ANDOVER
36 BARTLET STREET

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

SUBGADE, GAS SYSTEM AND DRAINAGE SYSTEM ASBUILT

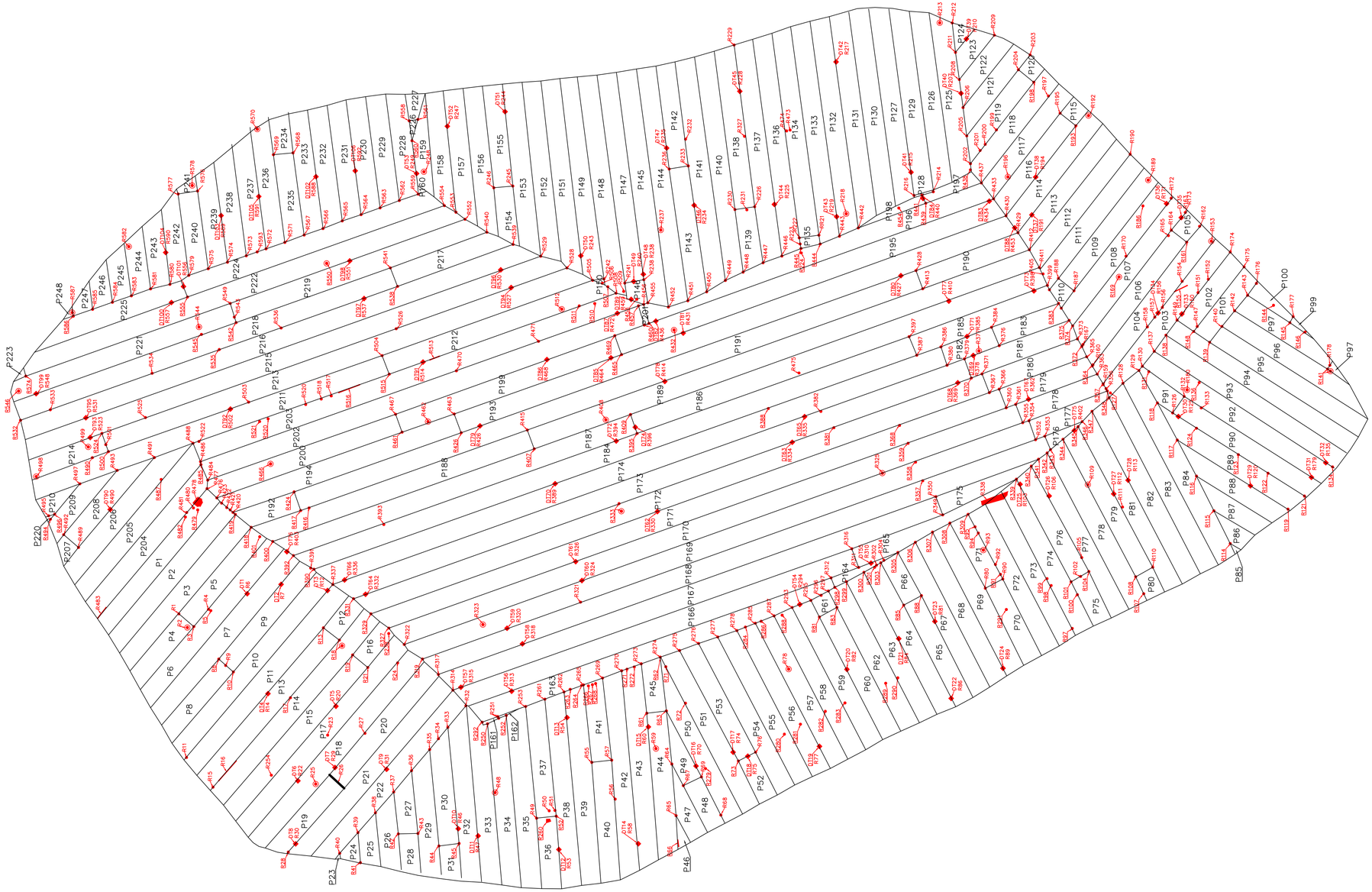
SURVEY BY: AJ, MB
COMPUTATIONS BY: RSB
DRAFTING BY: RSB

SCALE 1" = 60'

DATE: 03-28-2025

LEGEND

- LINER SEAM
- CAPPED LINER SEAM
- R001 PATCH
- DT001 BOOT
- DT001 DESTRUCTIVE SAMPLE



NOTES
1.SURVEY BY TRIMBLE GPS RTK SYSTEM.
2.BEARINGS AND COORDINATES ARE BASED ON THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM (NAD83).
3.ELEVATIONS REFERENCE NGVD 29, BASED ON BENCHMARK : MASS DPW BRASS DISC NO. 5140Z, ELEVATION 171.799 (US SURVEY FEET) ON CHANDLER ROAD BRIDGE OVER NORTHBOUND LANE OF RT 495.
SEE SHEET G-2 OF PLAN BY CDM SMITH DATED MARCH 2023.
4.ALL INFORMATION ON THIS PLAN WAS SUPPLIED TO J BATES AND SON BY NEW ENGLAND LINER AS A RESULT OF THEIR SURVEY.

PREPARED BY:

J Bates and Son, LLC
57 LAWRENCE STREET
CLINTON MA, 01510
(978) 368-7001

PREPARED FOR:

TOWN OF ANDOVER
36 BARTLET STREET

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

LINER ASBUILT

SURVEY BY: NEL
COMPUTATIONS BY: NEL
DRAFTING BY: RSB

SCALE 1" = 60'

DATE: 03-28-2025

SHEET 3 OF 4

LEGEND

- 100 — MAJOR CONTOUR
- MINOR CONTOUR
- ODD CONTOUR
- LIMIT OF FINAL GRADING
- RIPRAP
- GRAVEL ACCESS ROAD
- ARTICULATED CONCRETE MAT
- ⌖206.55 — FINAL GRADING SPOT ELEVATION

N

RIPRAP (TYP.)

⌖168.28
⌖168.20
⌖168.22
⌖168.25
⌖165.85
⌖165.74
⌖165.63
⌖165.64
⌖165.67
⌖167.57
⌖167.67
⌖167.62
⌖208.24
208
208.35
⌖208.52

OCS STRUCTURE
RIM ELEV = 168.74
INVERT = 165.95

12" DIA HDPE PIPE

FES
INVERT =157.99

GRAVEL ACCESS ROAD (TYP.)

OCS STRUCTURE
RIM ELEV = 174.86
INVERT = 168.09

ARTICULATED CONCRETE BLOOCK MAT (TYP.)

12" DIA HDPE PIPE

FES
INVERT =166.22

LIMIT OF WETLAND REPLICATION

0 60 120 180

NOTES
1. SURVEY BY TRIMBLE GPS RTK SYSTEM AND PROPELLER DRONE SYSTEM.
2. BEARINGS AND COORDINATES ARE BASED ON THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM (NAD83).
3. ELEVATIONS REFERENCE NGVD 29, BASED ON BENCHMARK : MASS DPW BRASS DISC NO. 514OZ, ELEVATION 171.799 (US SURVEY FEET) ON CHANDLER ROAD BRIDGE OVER NORTHBOUND LANE OF RT 495.
SEE SHEET G-2 OF PLAN BY CDM SMITH DATED MARCH 2023.
4. SURVEY PERFORMED BY J BATES AND SON.
5. CONTOURS REPRESENT FINAL GRADING.

PREPARED BY:

J Bates and Son, LLC
57 LAWRENCE STREET
CLINTON MA, 01510
(978) 368-7001

PREPARED FOR:

TOWN OF ANDOVER
36 BARTLET STREET

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

FINAL GRADING ASBUILT

SURVEY BY: AJ, PROPELLER
COMPUTATIONS BY: RSB, PROPELLER
DRAFTING BY: RSB

SCALE 1" = 60'

DATE: 03-28-2025

SHEET 4 OF 4

Appendix C Monthly Construction Monitoring Reports

75 State Street, Suite 701
Boston, Massachusetts 02109
tel: 617 452-6000
fax: 617 345-3901
cdmsmith.com

October 16, 2023

Mr. Mark Fairbrother
Section Chief, Solid Waste Management
Massachusetts Department of Environmental Protection
Northeast Regional Office
150 Presidential Way
Woburn, Massachusetts 01801

Subject: Construction Monitoring Report No. 1
Ledge Road Landfill Closure
Town of Andover, Massachusetts
BWP SW11 Landfills - Authorization Number SW11AC-0000027

Dear Mr. Fairbrother:

On behalf of the Town of Andover (the Town), CDM Smith Inc. (CDM Smith) has prepared this Construction Monitoring Report No. 1 for the Ledge Road Landfill Closure Project. This report has been prepared to comply with Conditions 5c and 14d of the Massachusetts Department of Environmental Protection (MassDEP) approval dated May 16, 2023. This report covers the period September 1 – September 30, 2023.

Outside the reporting period, a pre-construction inspection was performed by Mr. Nathan Jones and Mr. Myles Johnson of CDM Smith on August 2, 2023. A pre-construction conference was held on August 16, 2023, with representatives from the Town, J. Bates & Son LLC (Bates) (Contractor), CDM Smith (Certifying Engineer/Engineer of Record), and Horsley Witten Group (Environmental Monitor for the Andover Conservation Commission).

Mr. Myles Johnson of CDM Smith performed full-time construction monitoring during the reporting period and maintained the Daily Construction Activity Log. Mr. Nathan Jones of CDM Smith performed one periodic inspection during the reporting period on September 22, 2023.

A pre-construction Massachusetts Contingency Plan (MCP) Public Involvement Plan (PIP) Meeting was held on September 12, 2023.

Summary of work completed during the reporting period

- On September 14, 2023, Bates mobilized equipment and personnel to the site to install erosion controls. The erosion control locations had been staked in the field by Bates' surveyor and approved by the Town of Andover Conservation Agent and the Conservation Commission's Environmental Monitor prior to installation on September 5, 2023. Erosion controls were

installed by Bates' subcontractor, S&M Farms, Inc. Erosion controls were approved by the Town of Andover Conservation Agent and the Environmental Monitor following installation.

- Clearing limits were staked by Bates and approved by the Town of Andover Conservation Agent and the Environmental monitor.
- A temporary fence was installed by Bates.
- 360 Wood Products / Soini, Bates' clearing subcontractor, began clearing and grubbing on September 28, 2023.

Weather events during the reporting period (greater than one inch precipitation):

- Approximately 3.22 inches rain fell on September 18.

Items inspected to be in conformance with project approvals:

- Erosion controls installed per project controls, intact, and functioning.

Deviations from project approvals noted:

The Town of Andover Conservation Commission approved an Insignificant Change to the Order of Conditions at their September 5, 2023, meeting to allow wetland soil excavation to occur during the winter when the ground is sufficiently frozen, dry, or otherwise stable to support the equipment being used to complete the excavation. Wetland soil excavation was originally planned to occur during the summer/fall to comply with the Town of Andover Conservation Commission Order of Conditions Time-of-Year restrictions; however, due to the unusually high amounts of rainfall during the summer of 2023 (20.59 inches of rain between July 1st and August 18th), the wetland excavation areas were too wet to complete the excavation during the summer/fall as originally planned.

Administrative Consent Order Schedule:

The Town entered into an Administrative Consent Order (ACO) with the MassDEP on November 29, 2022, to complete remaining landfill closure activities at the Ledge Road Landfill. The ACO requires that the landfill cap be substantially complete by June 30, 2025, and submission of a category BWP SW43 "Landfill Closure Completion" for the certification of closure construction by November 1, 2025. It is currently anticipated that the project will be completed in accordance with the ACO schedule.

Photographs documenting the construction progress are attached.

Certification

I, Nathan E. Jones, attest under the pains and penalties of perjury that:

(a) I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification statement;

(b) based on my inquiry of those persons responsible for obtaining the information, the information contained in this submittal is, to the best of my knowledge, true, accurate, and complete;

(c) I am fully authorized to bind the entity required to submit these documents and to make this attestation on behalf of such entity; and

(d) I am aware that there are significant penalties, including, but not limited to, possible administrative and civil penalties for submitting false, inaccurate, or incomplete information and possible fines and imprisonment for knowingly submitting false, inaccurate, or incomplete information.

Please do not hesitate to contact me at (617) 452-6563 if you have any questions or need anything further.

Very truly yours,

Nathan E. Jones, P.E., PMP
Project Manager
CDM Smith Inc.

Attachments
- Photographs

c: Richard Spieler, MassDEP
John Morey, MassDEP
Karen Stromberg, MassDEP
Chris Cronin, Andover
Carlos Jaquez, Andover
Myles Johnson, CDM Smith

Ledge Road Landfill Closure – Construction Monitoring Report No. 1
Photos

Pre-Construction – Wetland Condition

Pre-Construction – Outfall at Toe of Western Landfill Slope

Erosion Control Installation

Erosion Control Installation

Erosion Control Installation

Erosion Control Installation

Temporary Fence Installation at Chandler Road Parking Lot

Temporary Fence with MassDEP File # Sign at Chandler Road Entrance

Chipper Staged On-Site

Timber Pro Harvester Staged On-Site

Initial Clearing Progress at Chandler Road Parking Lot

Initial Clearing Progress

75 State Street, Suite 701
Boston, Massachusetts 02109
tel: 617 452-6000
fax: 617 345-3901
cdmsmith.com

November 15, 2023

Mr. Mark Fairbrother
Section Chief, Solid Waste Management
Massachusetts Department of Environmental Protection
Northeast Regional Office
150 Presidential Way
Woburn, Massachusetts 01801

Subject: Construction Monitoring Report No. 2
Ledge Road Landfill Closure
Town of Andover, Massachusetts
BWP SW11 Landfills - Authorization Number SW11AC-0000027

Dear Mr. Fairbrother:

On behalf of the Town of Andover (the Town), CDM Smith Inc. (CDM Smith) has prepared this Construction Monitoring Report No. 2 for the Ledge Road Landfill Closure Project. This report has been prepared to comply with Conditions 5c and 14d of the Massachusetts Department of Environmental Protection (MassDEP) approval dated May 16, 2023. This report covers the period October 1 – October 31, 2023.

Mr. Myles Johnson of CDM Smith performed full-time construction monitoring during the reporting period and maintained the Daily Construction Activity Log. Mr. Nathan Jones of CDM Smith performed one periodic inspection during the reporting period on October 4, 2023.

Summary of work completed during the reporting period

- J. Bates & Son LLC (Bates) began site grading, demolition, and compaction. Demolition included the plugging of an existing landfill drainage pipe.
- 360 Wood Products / Soini, Bates' clearing subcontractor, completed clearing and grubbing activities, and demobilized from the site.
- Yankee Engineering and Testing, Inc, Bates' compaction testing subcontractor performed compaction testing on three days.

Bates prepared for the Greenwood Road drainage installation by locating existing utilities with Dig Safe. Weather events during the reporting period (greater than one inch precipitation):

- Approximately 1.09 inches rain fell on October 21.

WATER + ENVIRONMENT + TRANSPORTATION + ENERGY + FACILITIES

Items inspected to be in conformance with project approvals:

- Erosion controls installed per project controls, intact, and functioning with the exception of two areas: a small area on the northern boundary of the site did not have erosion controls installed as discarded utility poles unrelated to the site were left in the way of clearing and erosion control installation; 2) a short section of erosion of compost sock on the western boundary was damaged during site clearing activities. Both issues were addressed by Bates November 1st As recommended, Bates also moved an erosion control to be above the culvert at the eastern site boundary.

Deviations from project approvals noted:

There were no deviations from project approvals during this reporting period.

As previously noted, the Town of Andover Conservation Commission approved an Insignificant Change to the Order of Conditions at their September 5, 2023, meeting to allow wetland soil excavation to occur during the winter when the ground is sufficiently frozen, dry, or otherwise stable to support the equipment being used to complete the excavation.

Administrative Consent Order Schedule:

The Town entered into an Administrative Consent Order (ACO) with the MassDEP on November 29, 2022, to complete remaining landfill closure activities at the Ledge Road Landfill. The ACO requires that the landfill cap be substantially complete by June 30, 2025, and submission of a category BWP SW43 "Landfill Closure Completion" for the certification of closure construction by November 1, 2025. It is currently anticipated that the project will be completed in accordance with the ACO schedule.

Photographs documenting the construction progress are attached.

Certification

I, Nathan E. Jones, attest under the pains and penalties of perjury that:

(a) I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification statement;

(b) based on my inquiry of those persons responsible for obtaining the information, the information contained in this submittal is, to the best of my knowledge, true, accurate, and complete;

(c) I am fully authorized to bind the entity required to submit these documents and to make this attestation on behalf of such entity; and

(d) I am aware that there are significant penalties, including, but not limited to, possible administrative and civil penalties for submitting false, inaccurate, or incomplete information and

possible fines and imprisonment for knowingly submitting false, inaccurate, or incomplete information.

Please do not hesitate to contact me at (617) 452-6563 if you have any questions or need anything further.

Very truly yours,

Nathan E. Jones, P.E., PMP
Project Manager
CDM Smith Inc.

Attachments
- Photographs

c: Richard Spieler, MassDEP
John Morey, MassDEP
Karen Stromberg, MassDEP
Chris Cronin, Andover
Carlos Jaquez, Andover
Myles Johnson, CDM Smith

Ledge Road Landfill Closure – Construction Monitoring Report No. 2
Photos

Clearing Progress – Top of Landfill Facing East 10/5/2023

Initial Site Grading and Compaction 10/9/2023

Root and Branch Piles Prepared for Chipping. Chipped Branches were allowed to be taken Off-site while Chipped Roots were Required to Remain On-site.

Plugging of Existing Landfill Drain Pipe

Off-site Trucking of Timbers

Stockpile Relocation for Grading Progress 10/10/2023

Chipping of Roots and Branches for On-site Use or Disposal. Chipped Branches were allowed to be taken Off-site while Chipped Roots were Required to Remain On-site.

Site Grading Progress 10/10/2023

Clearing Work at Southeastern Site Boundary 10/11/2023

Initial Grading Progress 10/12/2023

Southern Portion of Site Cleared

General Site Photo 10/18/2023

Materials from Site Prepared for Disposal

Grading and Compaction Progress 10/19/2023

Stockpile Relocation for Grading Progress on 10/24/2023

Stockpile Relocation for Grading Progress on 10/25/2023

Street Sweeping at Chandler Road Entrance

Site Dust Control Using Water Truck

Site After Rain Event 10/20/2023- Work Postponed for the Day

75 State Street, Suite 701
Boston, Massachusetts 02109
tel: 617 452-6000
fax: 617 345-3901
cdmsmith.com

December 15, 2023

Mr. Mark Fairbrother
Section Chief, Solid Waste Management
Massachusetts Department of Environmental Protection
Northeast Regional Office
150 Presidential Way
Woburn, Massachusetts 01801

Subject: Construction Monitoring Report No. 3
Ledge Road Landfill Closure
Town of Andover, Massachusetts
BWP SW11 Landfills - Authorization Number SW11AC-0000027

Dear Mr. Fairbrother:

On behalf of the Town of Andover (the Town), CDM Smith Inc. (CDM Smith) has prepared this Construction Monitoring Report No. 3 for the Ledge Road Landfill Closure Project. This report has been prepared to comply with Conditions 5c and 14d of the Massachusetts Department of Environmental Protection (MassDEP) approval dated May 16, 2023. This report covers the period November 1 – November 31, 2023.

Mr. Myles Johnson of CDM Smith performed full-time construction monitoring during the reporting period and maintained the Daily Construction Activity Log. Mr. Nathan Jones of CDM Smith performed two periodic inspections during the reporting period on November 1 and November 29, 2023.

Summary of work completed during the reporting period

- J. Bates & Son LLC (Bates) continued site grading, demolition, and compaction.
- Yankee Engineering and Testing, Inc, Bates' compaction testing subcontractor performed compaction testing.

Weather events during the reporting period (greater than one inch precipitation):

- Approximately 1.42 inches fell on November 22.

Items inspected to be in conformance with project approvals:

- Erosion controls were inspected by the Environmental Monitor on November 1st and November 15th and were noted to be installed per project controls, intact, and functioning. The inspection on November 1st noted two areas requiring repair. One area on the northern boundary of the

WATER + ENVIRONMENT + TRANSPORTATION + ENERGY + FACILITIES

site did not have erosion controls installed as discarded utility poles unrelated to the site were left in the way of clearing and erosion control installation; another area on the western boundary has a short section of erosion of compost sock on the western boundary that was damaged during site clearing activities. Both issues were addressed by Bates early in November.

Deviations from project approvals noted:

There were no deviations from project approvals during this reporting period.

As previously noted, the Town of Andover Conservation Commission approved an Insignificant Change to the Order of Conditions at their September 5, 2023, meeting to allow wetland soil excavation to occur during the winter when the ground is sufficiently frozen, dry, or otherwise stable to support the equipment being used to complete the excavation.

Administrative Consent Order Schedule:

The Town entered into an Administrative Consent Order (ACO) with the MassDEP on November 29, 2022, to complete remaining landfill closure activities at the Ledge Road Landfill. The ACO requires that the landfill cap be substantially complete by June 30, 2025, and submission of a category BWP SW43 "Landfill Closure Completion" for the certification of closure construction by November 1, 2025. It is currently anticipated that the project will be completed in accordance with the ACO schedule.

Photographs documenting the construction progress are attached.

Certification

I, Nathan E. Jones, attest under the pains and penalties of perjury that:

(a) I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification statement;

(b) based on my inquiry of those persons responsible for obtaining the information, the information contained in this submittal is, to the best of my knowledge, true, accurate, and complete;

(c) I am fully authorized to bind the entity required to submit these documents and to make this attestation on behalf of such entity; and

(d) I am aware that there are significant penalties, including, but not limited to, possible administrative and civil penalties for submitting false, inaccurate, or incomplete information and possible fines and imprisonment for knowingly submitting false, inaccurate, or incomplete information.

Please do not hesitate to contact me at (617) 452-6563 if you have any questions or need anything further.

Very truly yours,

Nathan E. Jones, P.E., PMP
Project Manager
CDM Smith Inc.

Attachments
- Photographs

c: Richard Spieler, MassDEP
John Morey, MassDEP
Karen Stromberg, MassDEP
Chris Cronin, Andover
Carlos Jaquez, Andover
Myles Johnson, CDM Smith

Ledge Road Landfill Closure – Construction Monitoring Report No. 3
Photos

Equipment on site, grading and compacting moved materials - 11/01/2023

Excavator loading trucks for transport on site – 11/01/2023

Equipment moving materials on site – 11/02/2023

Excavator loading trucks for transport on site – 11/02/2023

Site view facing North – 11/02/2023

On site compaction testing – 11/06/2023

Site work facing North – 11/06/2023

Grading and compaction of transported site materials – 11/07/2023

Erosion controls installation at perimeter of loam pile – 11/08/2023

Excavator and rock trucks moving materials on site – 11/08/2023

Excavator loading rock trucks with materials on site – 11/08/2023

Facing Northeast at landfill work in progress – 11/08/2023

Facing South at site from temporary facility trailer – 11/08/2023

Truck dumping, dozer grading, and compactor rolling transported site materials – 11/08/2023

Facing South at landfill site after overnight rain – 11/09/2023

Rain event – 11/09/2023 – 0.24”

Site work in progress – 11/09/2023

Excavation, transport, and grading on site ongoing with compaction – 11/13/2023

Greenwood Road gas main mark-out with drain layout – 11/13/2023

On site grading and compaction of transported site materials continues – 11/13/2023

Compaction of transported materials – 11/14/2023

On site compaction testing with nuclear density gauge – 11/14/2023

Site materials relocation continues – 11/14/2023

Equipment moving materials on site – 11/15/2023

On site compaction testing – 11/21/2023

Daily road sweeping maintenance – 11/28/2023

Tires removed from site on 11/29/2023

Shed moving at 172 Greenwood Road to allow for new drain installation – 11/29/2023

75 State Street, Suite 701
Boston, Massachusetts 02109
tel: 617 452-6000
fax: 617 345-3901
cdmsmith.com

January 15, 2024

Mr. Mark Fairbrother
Section Chief, Solid Waste Management
Massachusetts Department of Environmental Protection
Northeast Regional Office
150 Presidential Way
Woburn, Massachusetts 01801

Subject: Construction Monitoring Report No. 4
Ledge Road Landfill Closure
Town of Andover, Massachusetts
BWP SW11 Landfills - Authorization Number SW11AC-0000027

Dear Mr. Fairbrother:

On behalf of the Town of Andover (the Town), CDM Smith Inc. (CDM Smith) has prepared this Construction Monitoring Report No. 4 for the Ledge Road Landfill Closure Project. This report has been prepared to comply with Conditions 5c and 14d of the Massachusetts Department of Environmental Protection (MassDEP) approval dated May 16, 2023. This report covers the period December 1 – December 31, 2023.

Mr. Myles Johnson of CDM Smith performed full-time construction monitoring during the reporting period and maintained the Daily Construction Activity Log. Mr. Nathan Jones of CDM Smith performed one periodic inspection during the reporting period on December 6, 2023.

Summary of work completed during the reporting period

- J. Bates & Son LLC (Bates) continued site grading, demolition, and compaction.
- Yankee Engineering and Testing, Inc, Bates' compaction testing subcontractor performed compaction testing.
- Groundwater monitoring wells were decommissioned by Geosearch, Inc, Bates drilling subcontractor.
- Waste Relocation was started but put on hold as an asbestos-cement pipe was encountered in the excavation. The area was covered in plastic sheeting and backfilled until a Massachusetts licensed asbestos abatement contractor can come oversee the removal of the asbestos-cement pipe around the expected limit of waste excavation. Prior to removal, the work will be permitted by the asbestos abatement contractor through MassDEP.

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Weather events during the reporting period (greater than one inch precipitation):

- Approximately 1.11 inches fell on December 10, 2023.
- Approximately 1.69 inches fell on December 11, 2023.
- Approximately 3.06 inches fell on December 18, 2023.

Items inspected to be in conformance with project approvals:

- Erosion controls were inspected by the Environmental Monitor on December 14th and were noted to be installed per project controls, intact, and functioning. The inspection noted that the area around the Chandler Road entrance should continue to be swept as needed. Bates generally completes sweeping at the end of each day.

Deviations from project approvals noted:

There were no deviations from project approvals during this reporting period.

As previously noted, the Town of Andover Conservation Commission approved an Insignificant Change to the Order of Conditions at their September 5, 2023, meeting to allow wetland soil excavation to occur during the winter when the ground is sufficiently frozen, dry, or otherwise stable to support the equipment being used to complete the excavation.

Administrative Consent Order Schedule:

The Town entered into an Administrative Consent Order (ACO) with the MassDEP on November 29, 2022, to complete remaining landfill closure activities at the Ledge Road Landfill. The ACO requires that the landfill cap be substantially complete by June 30, 2025, and submission of a category BWP SW43 "Landfill Closure Completion" for the certification of closure construction by November 1, 2025. It is currently anticipated that the project will be completed in accordance with the ACO schedule.

Photographs documenting the construction progress are attached.

Certification

I, Nathan E. Jones, attest under the pains and penalties of perjury that:

(a) I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification statement;

(b) based on my inquiry of those persons responsible for obtaining the information, the information contained in this submittal is, to the best of my knowledge, true, accurate, and complete;

(c) I am fully authorized to bind the entity required to submit these documents and to make this attestation on behalf of such entity; and

(d) I am aware that there are significant penalties, including, but not limited to, possible administrative and civil penalties for submitting false, inaccurate, or incomplete information and possible fines and imprisonment for knowingly submitting false, inaccurate, or incomplete information.

Please do not hesitate to contact me at (617) 452-6563 if you have any questions or need anything further.

Very truly yours,

Nathan E. Jones, P.E., PMP
Project Manager
CDM Smith Inc.

Attachments
- Photographs

c: Richard Spieler, MassDEP
John Morey, MassDEP
Karen Stromberg, MassDEP
Chris Cronin, Andover
Carlos Jaquez, Andover
Myles Johnson, CDM Smith

Geosearch observation well abandonment crew on site – 12/04/2023

Greenwood at Ledge Road gas main and water mains marked – 12/04/2023

Landfill top looking north – 12/05/2023

Grading of southwest portion of landfill– 12/05/2023

Grading of western slope of landfill– 12/05/2023

General site photo looking south – 12/06/2023

Grading progress, looking north from Greenwood Road – 12/07/2023

Relocation, grading, and compaction of site materials – 12/07/2023

Relocation and grading existing landfill materials – 12/07/2023

Additional tree clearing and grubbing – 12/11/2023

Landfill top regrading work – 12/12/2023

Looking north from Greenwood Road at regrading work – 12/12/2023

Site grading and compaction – 12/12/2023

Additional erosion controls delivered to site – 12/13/2023

Landfill erosion controls maintained – 12/13/2023

Landfill site regrading – 12/13/2023

Additional erosion controls installed along southwestern edge of landfill – 12/13/2023

Regrading work continues – 12/13/2023

Landfill top looking south – 12/13/2023

Existing AC drainpipe encountered at start of waste relocation near western edge of site – 12/14/2023

Regrading work– 12/15/2023

Grading progress looking north from Greenwood Road – 12/15/2023

Sub grade compaction testing with nuclear densometer – 12/15/2023

Active site work minimized due to rain and wind – 12/18/2023 – 3” of rain

Additional erosion controls delivered to site – 12/19/2023

Erosion controls maintenance after rain event – 12/19/2023

Greenwood Road partially flooded from rain event – 12/19/2023

Regrading work continues on site – 12/21/2023

Looking north from Greenwood Road at regrading work in progress – 12/22/2023

2” and 3” pumps dewatering pond with discharge to filter bad at southeastern edge of site – 12/27/2023

Grading progress on eastern edge of site – 12/27/2023

75 State Street, Suite 701
Boston, Massachusetts 02109
tel: 617 452-6000
fax: 617 345-3901
cdmsmith.com

February 14, 2024

Mr. Mark Fairbrother
Section Chief, Solid Waste Management
Massachusetts Department of Environmental Protection
Northeast Regional Office
150 Presidential Way
Woburn, Massachusetts 01801

Subject: Construction Monitoring Report No. 4
Ledge Road Landfill Closure
Town of Andover, Massachusetts
BWP SW11 Landfills - Authorization Number SW11AC-0000027

Dear Mr. Fairbrother:

On behalf of the Town of Andover (the Town), CDM Smith Inc. (CDM Smith) has prepared this Construction Monitoring Report No. 4 for the Ledge Road Landfill Closure Project. This report has been prepared to comply with Conditions 5c and 14d of the Massachusetts Department of Environmental Protection (MassDEP) approval dated May 16, 2023. This report covers the period January 1 – January 31, 2024.

Mr. Myles Johnson of CDM Smith performed full-time construction monitoring during the reporting period and maintained the Daily Construction Activity Log. Mr. Nathan Jones of CDM Smith performed one periodic inspection during the reporting period on January 3rd, 2024.

Summary of work completed during the reporting period

- J. Bates & Son LLC (Bates) continued site grading and compaction.
- Yankee Engineering and Testing, Inc, Bates' compaction testing subcontractor performed compaction testing.
- The asbestos-cement pipe encountered in the waste relocation excavation was removed, containerized, and shipped off site by AirSafe of Hopkinton, MA, Bates' asbestos removal subcontractor. Mr. James Young of Four Brothers Environmental of Greenland, NH, a Commonwealth of Massachusetts licensed Asbestos Project Monitor, completed an asbestos visual inspection of the project area and did not identify any visible dust, debris, or residue. The Four Brothers Asbestos Air Clearance Report and Certificate of Visual Inspection are attached.
- Waste Relocation was completed in Waste Relocation Areas (WRA) 3 through 5. Sampling results from these areas confirmed that all waste impacted material was removed, and these areas were backfilled with imported common fill.

WATER + ENVIRONMENT + TRANSPORTATION + ENERGY + FACILITIES

- Waste Relocation was also conducted in WRA-1 where the asbestos cement pipe was encountered. Results showed elevated concentrations of lead and zinc exceeding RCS-1, indicating that some waste impacted material remained. Additional excavation in this area was performed in early February, outside the reporting period, and confirmation samples confirmed that waste impacted material was successfully removed. Additional details will be provided in the next Construction Monitoring Report.

- Erosion control installation and maintenance was completed throughout the month by S&M Farms Inc. (S&M), Bates' erosion control subcontractor.

- Bates imported to the site and stockpiled for later use leaf compost, for amending the topsoil to be used in the wetland areas and landfill cap, and common fill, for backfilling waste relocation areas and forming the berms of the off-cap northern detention base.

Weather events during the reporting period (greater than one inch precipitation):

- Approximately 1.72 inches fell on January 10, 2024.

- Approximately 1.07 inches fell on January 13, 2024.

Items inspected to be in conformance with project approvals:

- Erosion controls were inspected by the Environmental Monitor on January 3rd and January 24th. On January 3rd, several areas with breached erosion controls and sediment migration beyond the limit of work were noted. These breaches in the erosion controls were the result of three successive storms and the excessive rainfall (approximately 6 inches) during the previous month (see Construction Monitoring Report No. 4 covering December 2023). Bates immediately remediated the sediment migration and in addition to repairing/supplementing the compost sock, Bates' subcontractor S&M installed silt fence to fortify the erosion controls on January 4th and January 5th. Following the rain event on January 10th, and in anticipation of the rain event on January 13th, S&M installed additional controls, including haybales, on January 12th. During the January 24th inspection, gaps in erosion control coverage were noted, these issues were addressed by Bates/S&M within a week and confirmed with the Environmental Monitor on February 1st.

Deviations from project approvals noted:

There were no deviations from project approvals during this reporting period.

As previously noted, the Town of Andover Conservation Commission approved an Insignificant Change to the Order of Conditions at their September 5, 2023, meeting to allow wetland soil excavation to occur during the winter when the ground is sufficiently frozen, dry, or otherwise stable to support the equipment being used to complete the excavation.

Administrative Consent Order Schedule:

The Town entered into an Administrative Consent Order (ACO) with the MassDEP on November 29, 2022, to complete remaining landfill closure activities at the Ledge Road Landfill. The ACO requires that the landfill cap be substantially complete by June 30, 2025, and submission of a category BWP SW43 "Landfill Closure Completion" for the certification of closure construction by November 1, 2025. It is currently anticipated that the project will be completed in accordance with the ACO schedule.

Photographs documenting the construction progress are attached.

Certification

I, Nathan E. Jones, attest under the pains and penalties of perjury that:

(a) I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification statement;

(b) based on my inquiry of those persons responsible for obtaining the information, the information contained in this submittal is, to the best of my knowledge, true, accurate, and complete;

(c) I am fully authorized to bind the entity required to submit these documents and to make this attestation on behalf of such entity; and

(d) I am aware that there are significant penalties, including, but not limited to, possible administrative and civil penalties for submitting false, inaccurate, or incomplete information and possible fines and imprisonment for knowingly submitting false, inaccurate, or incomplete information.

Please do not hesitate to contact me at (617) 452-6563 if you have any questions or need anything further.

Very truly yours,

Nathan E. Jones, P.E., PMP
Project Manager
CDM Smith Inc.

Attachments
- Photographs
- Asbestos Air Clearance Report and Certificate of Visual Inspection

c: Richard Spieler, John Morey, and Karen Stromberg, MassDEP
Chris Cronin and Carlos Jaquez, Town of Andover
Myles Johnson, CDM Smith

Excavation in Waste Relocation Area (WRA) 5 with quantity survey in progress – 1/02/2024

Excavation in WRA-5 – 01/02/2024

Hoses and filter bag used for dewatering waste relocation areas – 01/02/2024

Excavation in WRA-5 – 01/02/2024

Additional erosion controls delivered to site for maintenance – 01/03/2024

Chipping of tree roots – 01/04/2024

Compaction testing – 01/04/2024

Erosion control maintenance and cleanup – 01/04/2024

Erosion control maintenance – 01/04/2024

Erosion controls reinforced with added silt fencing – 01/04/2024

Excavation for regrading in progress – 01/04/2024

Extensive erosion control maintenance following heavy rain event – 01/04/2024

General site photo taken from Greenwood Road looking north – 01/04/2024

Silt fencing being added for erosion controls – 01/04/2024

Tire disposal stockpile – 01/04/2024

Chandler Road site construction vehicle access road maintenance – 01/05/2024

New erosion controls along northwestern edge of site – 01/05/2024

On-site roadway maintenance – 01/05/2024

Ledge Road Landfill site looking north from Greenwood Road – 01/08/2024

Major site work postponed due to overnight snow accumulation – 01/08/2024

Site work other than cleanup postponed due to overnight snow accumulation – 01/08/2024

Ledge Road Landfill regrading work – 01/09/2024

Greenwood Road flooding at Ledge Road after rain event – 01/10/2024

Overnight rain event impact on erosion controls – 01/10/2024

Greenwood Road following dewatering activities on-site – 01/11/2024

Added erosion controls – 01/12/2024

Additional erosion controls being installed – 01/12/2024

Erosion controls maintenance and fortification – 01/12/2024

Erosion controls reinforced – 01/12/2024

Maintenance of erosion controls – 01/12/2024

Waste relocation area 5 backfilled – 01/12/2024

AC underdrain pipe being uncovered for removal – 01/15/2024

Handwork to uncover AC pipe – 01/15/2024

Regrading of site continues – 01/15/2024

Regrading work – 01/15/2024

Deliveries of compost for mixing with loam – 01/18/2024

Placement of AC pipe in roll-off container for removal from site – 01/18/2024

Container for AC pipe being loaded to be disposed off site – 01/18/2024

Area 1 waste relocation – 01/22/2024

Landfill site looking north – 01/22/2024

Regrading work continues on site – 01/22/2024

Regrading work viewed from Greenwood Road – 01/24/2024

Site work minimized due to weather conditions – 01/29/2024

Dewatering discharge into filter bag from waste removal area 4 – 01/30/2024

Erosion controls for repairs – 01/30/2024

Erosion controls installed 1/29-1/30, picture taken 1/31/2024

Erosion controls installed 1/29-1/30, picture taken 1/31/2024

Erosion controls installed 1/29-1/30, picture taken 1/31/2024

PO Box 52
Hopkinton, MA 01748
978-339-5361
airsafeinc@airsafeinc.com

Andover Town Landfill
110 Chandler Rd
Andover, MA 01810

January 23, 2024

Site Address: Same

To Whom It May Concern,

Please advise any interested party that Air Safe, Inc. is the licensed asbestos contractor (MA License # AC000464) that recently completed the extraction of transite pipes within a trench located on the property at the above listed site address. The work was successfully completed in accordance with all applicable federal, State, and local regulations.

The work area underwent a successful post abatement inspection by the licensed industrial hygienist firm of Four Brothers Environmental. A copy of their report is available directly from Four Brothers Environmental.

We trust you have found our services to have met your needs. If you have any questions regarding the work performed, please call us at 978-339-5361.

Sincerely,

David F. Walsh

David F. Walsh
Air Safe, Inc.

FOUR BROTHERS ENVIRONMENTAL

9 Alden Avenue
Greenland, NH 03840

January 29, 2024

Asbestos Air Clearance Report

Site Address:
110 Chandler Road
Andover, MA 01810

Attn:
Michael Bates
J. Bates & Son, LLC
57 Lawrence Street
Clinton, MA 01510

Dear Mr. Bates,

Please take this letter as notification that the above job site, 110 Chandler Road, Andover, MA 01810, is in accordance with Commonwealth of Massachusetts 453 CMR 6.14, 310 CMR 7.15, and all other State, Federal and Local regulations. On January 18, 2024, a Massachusetts Department of Labor Standards-licensed project monitor conducted an asbestos visual inspection. No visible dust or debris was found by the project monitor.

Please contact me if you have any questions.

Best regards,

Jeff Young
Vice President

Attachments:
Certificate of Visual Inspection
Certifications

FOUR BROTHERS ENVIRONMENTAL

9 Alden Avenue
Greenland, NH 03840

Certificate of Visual Inspection

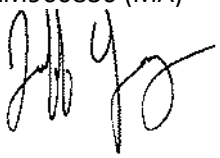
280-MA-24-001

FOUR BROTHERS ENVIRONMENTAL

9 Alden Avenue
Greenland, NH 03840

Certificate of Visual Inspection

An asbestos visual inspection was conducted by a Commonwealth of Massachusetts-licensed project monitor in the below work area(s). The project monitor did not identify any visible dust, debris, or residue. The scope of work described herein is complete and the work area(s) passed the visual inspection.

Date:	January 18, 2024
Site Address:	110 Chandler Road, Andover, MA 01810
Client:	J. Bates & Son, LLC
Asbestos Contractor:	Air Safe
Asbestos Supervisor:	Ivan Carcamo
Scope of Work:	Approximately 150 linear feet of transite pipe.
Work Area(s):	Underground at NE corner of property at bottom of embankment, running NW-SE
Notes:	
Project Monitor Name:	Jeff Young
License Number:	AM900836 (MA)
Project Monitor Signature:	

280-MA-24-001

9 Alden Avenue
Greenland, NH 03840

Licenses & Certifications

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DEPARTMENT OF LABOR STANDARDS

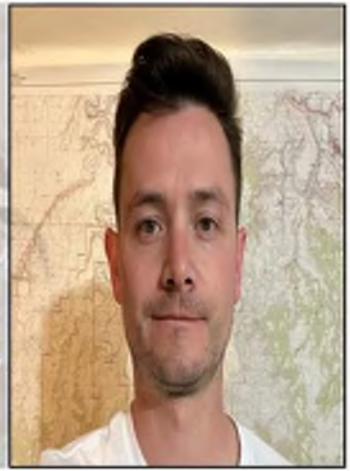
Michael Flanagan
Director

ASBESTOS PROJECT MONITOR

JAMES JEFF YOUNG
Eff.Date: 05/23/2023
Exp.Date: 05/22/2024
AM900836

Member C.O.N.E.S.
HVR NEW

24



This is to certify that

James J. Young, Jr

33 Aldrich Road, Portsmouth, NH 03801

has completed the requisite training by Video Conference, and has passed an examination for reaccreditation

Asbestos Project Monitor Refresher

pursuant to Title II of the Toxic Substance Control Act, 15 U.S.C. 2646

Course Location
Zoom Video Conference
Institute for Environmental Education 16 Upton Drive Wilmington, MA 01887

May 19, 2023
Course Dates

May 19, 2023
Examination Date

23-4918-174-275781
Certificate Number

May 19, 2024
Expiration Date

Training Director

16 Upton Drive, Wilmington, MA 01887 Telephone 978.658.5272 www.ieetrains.com

INSTITUTE FOR ENVIRONMENTAL EDUCATION

Erosion controls installed 1/29-1/30, picture taken 1/31/2024

75 State Street, Suite 701
Boston, Massachusetts 02109
tel: 617 452-6000
fax: 617 345-3901
cdmsmith.com

March 15, 2024

Mr. Mark Fairbrother
Section Chief, Solid Waste Management
Massachusetts Department of Environmental Protection
Northeast Regional Office
150 Presidential Way
Woburn, Massachusetts 01801

Subject: Construction Monitoring Report No. 6
Ledge Road Landfill Closure
Town of Andover, Massachusetts
BWP SW11 Landfills - Authorization Number SW11AC-0000027

Dear Mr. Fairbrother:

On behalf of the Town of Andover (the Town), CDM Smith Inc. (CDM Smith) has prepared this Construction Monitoring Report No. 6 for the Ledge Road Landfill Closure Project. This report has been prepared to comply with Conditions 5c and 14d of the Massachusetts Department of Environmental Protection (MassDEP) approval dated May 16, 2023. This report covers the period February 1 – February 29, 2024.

Mr. Myles Johnson of CDM Smith performed full-time construction monitoring during the reporting period and maintained the Daily Construction Activity Log. Mr. Nathan Jones of CDM Smith performed one periodic inspection during the reporting period on February 7th, 2024.

Summary of work completed during the reporting period

- J. Bates & Son LLC (Bates) continued site grading and compaction.
- Yankee Engineering and Testing, Inc, Bates' compaction testing subcontractor performed compaction testing.
- Waste Relocation continued in WRA-1 where the asbestos-cement pipe was encountered in late December. Initial confirmation sampling results showed elevated concentrations of lead and zinc exceeding RCS-1, indicating the potential that some waste impacted material remained. Additional excavation in this area was performed in early February and confirmation samples confirmed that waste impacted material was successfully removed. WRA-2 was also completed in early February with sample results confirming that all waste impacted material was removed.
- Erosion control installation and maintenance was completed throughout the month by S&M Farms Inc. (S&M), Bates' erosion control subcontractor.

WATER + ENVIRONMENT + TRANSPORTATION + ENERGY + FACILITIES

- Materials for the Greenwood Road Drainage Improvements were delivered to the site in preparation for installation in March.

- Bates prepared for wetland soil hot spot excavation by clearing the haul road, installing erosion controls around the work area, and staking removal areas. Wetland soil excavation began in early March outside of this reporting period.

Weather events during the reporting period (greater than one inch precipitation):

- There were no precipitation events greater than one inch during this reporting period. The largest storm was 0.31 inches of rain recorded on February 28th.

Items inspected to be in conformance with project approvals:

- Erosion controls were inspected by the Environmental Monitor on February 7th and February 26th. Both reports noted minor issues which have been addressed by Bates as part of their ongoing erosion control maintenance.

Deviations from project approvals noted:

There were no deviations from project approvals during this reporting period.

As previously noted, the Town of Andover Conservation Commission approved an Insignificant Change to the Order of Conditions at their September 5, 2023, meeting to allow wetland soil excavation to occur during the winter when the ground is sufficiently frozen, dry, or otherwise stable to support the equipment being used to complete the excavation.

Administrative Consent Order Schedule:

The Town entered into an Administrative Consent Order (ACO) with the MassDEP on November 29, 2022, to complete remaining landfill closure activities at the Ledge Road Landfill. The ACO requires that the landfill cap be substantially complete by June 30, 2025, and submission of a category BWP SW43 "Landfill Closure Completion" for the certification of closure construction by November 1, 2025. It is currently anticipated that the project will be completed in accordance with the ACO schedule.

Photographs documenting the construction progress are attached.

Certification

I, Nathan E. Jones, attest under the pains and penalties of perjury that:

(a) I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification statement;

(b) based on my inquiry of those persons responsible for obtaining the information, the information contained in this submittal is, to the best of my knowledge, true, accurate, and complete;

(c) I am fully authorized to bind the entity required to submit these documents and to make this attestation on behalf of such entity; and

(d) I am aware that there are significant penalties, including, but not limited to, possible administrative and civil penalties for submitting false, inaccurate, or incomplete information and possible fines and imprisonment for knowingly submitting false, inaccurate, or incomplete information.

Please do not hesitate to contact me at (617) 452-6563 if you have any questions or need anything further.

Very truly yours,

Nathan E. Jones, P.E., PMP
Project Manager
CDM Smith Inc.

Attachments
- Photographs

c: Richard Spieler, John Morey, and Karen Stromberg, MassDEP
Chris Cronin and Carlos Jaquez, Town of Andover
Myles Johnson, CDM Smith

Ledge Road Landfill Closure – Construction Monitoring Report No. 6
Photos

Excavation at Waste Removal Area 2 – 02/05/2024

Landfill site grading work at eastern edge – 02/05/2024

Long reach-stick excavator for wetland excavation delivered to site – 02/05/2024

Grading material being moved to northern edge of landfill– 02/06/2024

Grading material being temporarily stockpiled for grading in parking lot area– 02/06/2024

View of eastern slope of landfill from Greenwood Road at Ledge Road – 02/06/2024

View of landfill plateau regrading work looking south – 02/06/2024

Landfill grading looking southeast towards Greenwood Road – 02/07/2024

Landfill grading– 02/07/2024

Landfill grading looking west from plateau – 02/07/2024

Landfill grading– 02/07/2024

Grading in progress looking southeast on landfill plateau – 02/07/2024

Landfill grading looking north from southwest corner – 02/09/2024

Landfill grading progress looking northeast– 02/09/2024

Dewatering pumps discharging into silt bag – 02/12/2024

Landfill grading– 02/12/2024

Landfill grading progress – 02/12/2024

Landfill view looking northwest from Greenwood Road – 02/13/2024

Minimal site work due to winter storm – 02/13/2024

Southern slope grading looking from Greenwood Road – 02/16/2024

Wetlands re-staking work in progress – 02/16/2024

Landfill grading– 02/19/2024

Landfill grading progress looking south – 02/19/2024

Landfill grading at southwest corner of landfill – 02/19/2024

Reinforced concrete drainpipe delivered to site – 02/20/2024

Waste Relocation Area 1 after backfilling, grading, and reinstallation of erosion controls – 02/21/2024

Vernal pool area with reinforced erosion controls in place – 02/21/2024

Reinforced Concrete Pipe (RCP) with gaskets staged for drain installation – 02/21/2024

Landfill grading– 02/21/2024

Temporary haul road for wetland soil transport staked out at western edge of landfill – 02/21/2024

Erosion controls installed along wetland soil haul road – 02/22/2024

Additional erosion controls at edges of added access road with wood matting – 02/27/2024

Southern slope of landfill looking north – 02/27/2024

Western slope of landfill looking north – 02/27/2024

Wetlands Excavation Area 1 with erosion controls in place – 02/27/2024

Drainage manhole and catch basin precast concrete structures delivered to site – 02/29/2024

Long reach-stick excavator to be used for wetland excavation work – 02/29/2024

Precast concrete structures, pile of tires to be disposed offsite, and mats at lay down area northwest corner of landfill site – 02/29/2024

Sandbag cofferdam set-up for wetland work – 02/29/2024

75 State Street, Suite 701
Boston, Massachusetts 02109
tel: 617 452-6000
fax: 617 345-3901
cdmsmith.com

April 16, 2024

Mr. Mark Fairbrother
Section Chief, Solid Waste Management
Massachusetts Department of Environmental Protection
Northeast Regional Office
150 Presidential Way
Woburn, Massachusetts 01801

Subject: Construction Monitoring Report No. 7
Ledge Road Landfill Closure
Town of Andover, Massachusetts
BWP SW11 Landfills - Authorization Number SW11AC-0000027

Dear Mr. Fairbrother:

On behalf of the Town of Andover (the Town), CDM Smith Inc. (CDM Smith) has prepared this Construction Monitoring Report No. 7 for the Ledge Road Landfill Closure Project. This report has been prepared to comply with Conditions 5c and 14d of the Massachusetts Department of Environmental Protection (MassDEP) approval dated May 16, 2023. This report covers the period March 1 –March 31, 2024.

Mr. Myles Johnson of CDM Smith performed full-time construction monitoring during the reporting period and maintained the Daily Construction Activity Log. Mr. Nathan Jones of CDM Smith performed two periodic inspections during the reporting period on March 6 and March 14, 2024.

Summary of work completed during the reporting period

- J. Bates & Son LLC (Bates) continued site grading and compaction. Landfill shaping and grading are nearly complete.
- Yankee Engineering and Testing, Inc, Bates' compaction testing subcontractor performed compaction testing.
- Erosion control installation and maintenance was completed throughout the month by S&M Farms Inc. (S&M), Bates' erosion control subcontractor.
- Bates completed wetland soil hot spot excavation in all areas. Wetland Soil Removal Areas 3 and 5 were expanded slightly due to confirmation samples with arsenic concentrations above the site specific cleanup standard of 900 mg/kg. The last confirmation sample was collected just outside of the reporting period on April 1. Final confirmation samples for all areas were below the site specific cleanup standard.

WATER + ENVIRONMENT + TRANSPORTATION + ENERGY + FACILITIES

- Passive Landfill Gas Vents were drilled and installed by Recovery Drilling Services of Dudley, MA from March 11th to March 22nd. Four vent locations were drilled through waste to confirm the bottom elevation of waste across the site. These four boreholes were plugged with bentonite before installing the vents. The observed bottom elevation of the waste was used to confirm bottom of vent depths were at least 10 feet above the bottom of waste and at least 5 feet above the water table.

Weather events during the reporting period (greater than one inch precipitation):

- Approximately 1.01 inches of precipitation were recorded on March 2nd.
- Approximately 1.30 inches of precipitation were recorded on March 7th.
- Approximately 2.31 inches of precipitation were recorded on March 23rd.
- Approximately 1.48 inches of precipitation were recorded on March 28th.

Items inspected to be in conformance with project approvals:

- Erosion controls were inspected by the Environmental Monitor on March 6th, March 13th, March 20th, and March 27th. All of the reports noted minor issues which have been addressed by Bates as part of their ongoing erosion control maintenance. Reports from March 13th and March 20th noted some erosion control failures that resulted in sedimentation migrating outside of the limit of work. These areas were remediated prior to the inspection on March 27th.

Deviations from project approvals noted:

There were no deviations from project approvals during this reporting period.

As previously noted, the Town of Andover Conservation Commission approved an Insignificant Change to the Order of Conditions at their September 5, 2023, meeting to allow wetland soil excavation to occur during the winter when the ground is sufficiently frozen, dry, or otherwise stable to support the equipment being used to complete the excavation. Due to an unusually mild winter, the ground in the wetland areas did not freeze. Wetland excavation was completed in March once the ground had dried sufficiently to be able to support the excavation equipment.

Administrative Consent Order Schedule:

The Town entered into an Administrative Consent Order (ACO) with the MassDEP on November 29, 2022, to complete remaining landfill closure activities at the Ledge Road Landfill. The ACO requires that the landfill cap be substantially complete by June 30, 2025, and submission of a category BWP SW43 “Landfill Closure Completion” for the certification of closure construction by November 1, 2025. It is currently anticipated that the project will be completed in accordance with the ACO schedule.

Photographs documenting the construction progress are attached.

Certification

I, Nathan E. Jones, attest under the pains and penalties of perjury that:

(a) I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification statement;

(b) based on my inquiry of those persons responsible for obtaining the information, the information contained in this submittal is, to the best of my knowledge, true, accurate, and complete;

(c) I am fully authorized to bind the entity required to submit these documents and to make this attestation on behalf of such entity; and

(d) I am aware that there are significant penalties, including, but not limited to, possible administrative and civil penalties for submitting false, inaccurate, or incomplete information and possible fines and imprisonment for knowingly submitting false, inaccurate, or incomplete information.

Please do not hesitate to contact me at (617) 452-6563 if you have any questions or need anything further.

Very truly yours,

Nathan E. Jones, P.E., PMP
Project Manager
CDM Smith Inc.

Attachments
- Photographs

c: Richard Spieler, John Morey, and Karen Stromberg, MassDEP
Chris Cronin and Carlos Jaquez, Town of Andover
Myles Johnson, CDM Smith

Ledge Road Landfill Closure – Construction Monitoring Report No. 7
Photos

General site progress from Greenwood Road – 3/01/2024

Temporary haul road for wetland soil excavation – 3/04/2024

Management of loam stockpile and continued site grading – 3/04/2024

Addition of lime to wetland soils to expedite drying – 3/04/2024

Hydrated lime stockpile for drying excavated wetland soils – 3/4/2024

Bucket rig used for landfill gas vent drilling delivered to site – 3/11/2024

Removal of asphalt in parking area – 3/11/2024

General site progress, viewed from southern corner of landfill – 3/12/2024

New construction entrance from Chandler Road – 3/12/2024

Wetland Excavation Area 7 complete, confirmation samples being collected – 3/12/2024

Landfill gas vent perforated pipe staged on site – 3/12/2024

Bucket drill rig prepared for drilling – 3/12/2024

Drilling of landfill gas vent using bucket drill rig – 3/12/2024

Waste material observed during vent 9 excavation and construction – 3/12/2024

Gravel backfill at vent 9 – 3/12/2024

Gas vent 9 constructed and temporarily capped – 3/12/2024

Drilling location photo at landfill gas vent 14 – 3/13/2024

Gas vent 14 installed – 3/13/2024

Wetland soil excavation in Wetland Excavation Area 6 using long reach excavator – 3/13/2024

Trees and branches from wetland excavation areas stockpiled for chipping – 3/13/2024

Additional erosion controls installed along western edge of landfill – 3/13/2024

Soil migration beyond limit of work observed – 3/14/2024

Vent 22 drilling location photo – 3/14/2024

Native soil encountered at 23ft bgs at Vent 22 – 3/14/2024

Installation of landfill gas vent 22 – 3/14/2024

Landfill gas vent 23 drilling location photo – 3/14/2024

Waste material observed at vent 23 – 3/14/2024

Installation of landfill gas vent 23 – 3/14/2024

Site grading progress viewed from parking lot area – 3/14/2024

Additional erosion controls delivered to the site – 3/14/2024

Installation of erosion controls around topsoil stripped from landfill top – 3/14/2024

Repaired silt fence around topsoil stripped from landfill top – 3/14/2024

General site progress, view from southeastern edge of landfill – 3/14/2024

18-inch flat panel piping staged on site – 3/14/2024

Erosion control maintenance in front of Wetland Excavation Area 2 following rain event – 3/18/2024

Wetland soil drying area on landfill top – 3/18/2024

Wetland soil excavation in Area 6 – 3/19/2024

Drilling of landfill gas vent using bucket drill rig – 3/19/2024

Material stockpiles staged on southern portion of landfill – 3/20/2024

Trees and branches removed from wetland excavation areas staged for chipping – 3/20/2024

Erosion control reinforcement – 3/21/2024

Wetland stream bed soil sampling following excavations – 3/21/2024

Former parking lot area with new construction entrance and completed grading – 3/21/2024

Ongoing sand and loam site deliveries – 3/21/2024

Chipping of trees and branches from wetland soil excavation areas – 3/24/2024

Coir logs for stream bank restoration delivered to site – 3/24/2024

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May 15, 2024

Mr. Mark Fairbrother
Section Chief, Solid Waste Management
Massachusetts Department of Environmental Protection
Northeast Regional Office
150 Presidential Way
Woburn, Massachusetts 01801

Subject: Construction Monitoring Report No. 8
Ledge Road Landfill Closure
Town of Andover, Massachusetts
BWP SW11 Landfills - Authorization Number SW11AC-0000027

Dear Mr. Fairbrother:

On behalf of the Town of Andover (the Town), CDM Smith Inc. (CDM Smith) has prepared this Construction Monitoring Report No. 8 for the Ledge Road Landfill Closure Project. This report has been prepared to comply with Conditions 5c and 14d of the Massachusetts Department of Environmental Protection (MassDEP) approval dated May 16, 2023. This report covers the period April 1 – April 31, 2024.

Mr. Myles Johnson of CDM Smith performed full-time construction monitoring during the reporting period and maintained the Daily Construction Activity Log. Mr. Nathan Jones of CDM Smith performed three periodic inspections during the reporting period on April 3, April 18, and April 26, 2024.

Summary of work completed during the reporting period

- J. Bates & Son LLC (Bates) continued site grading and compaction. Landfill shaping and grading are nearly complete.
- Yankee Engineering and Testing, Inc, Bates' compaction testing subcontractor performed compaction testing.
- Erosion control installation and maintenance was completed throughout the month by S&M Farms Inc. (S&M), Bates' erosion control subcontractor.
- The last confirmation sample for wetland soil hotspot excavation was collected on April 1st. Final confirmation samples for all areas were below the site-specific cleanup standard of 900 mg/kg.
- Bates' subcontractor, Hydrograss Technologies North Oxford, MA, completed bank stabilization on April 15th and April 16th except for the planting of sand bar willows, which will occur in May.

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- Installation of Greenwood Road drainage improvements began week of April 1st.
- The corrugated steel pipe at the end of Wetland Soil Removal Area #4 was replaced with an HDPE pipe of the same size on April 10th.
- Bates began installation the southern gas vent trench on April 15th.
- Deliveries of gas vent sand continued throughout the month of April.

Construction activity look ahead:

- Bates will complete Greenwood Road drainage improvements and installation of the southern gas vent trench in early-mid May.
- Hydrograss Technologies returned to the site during the week of May 6 to complete tree and bush plantings in the wetland areas, the work is expected to last approximately three weeks.
- One additional pickup of tires will be completed in May.
- Sand for the gas vent layer will continue to be delivered. Once Greenwood Road drainage improvements and installation of the southern gas vent trench are complete, Bates will begin spreading the sand for the gas venting layer in the southern portion of the landfill.
- Shaping of the northern (off-cap) detention basin is expected to begin in May and continue into June.
- Liner installation is expected to begin in June following installation of gas venting layer.

Weather events during the reporting period (greater than one inch precipitation):

- No precipitation events of greater than one inch occurred during the month of April.

Items inspected to be in conformance with project approvals:

- Erosion controls were inspected by the Environmental Monitor on April 3rd, April 11th, April 17th, and April 24th. The reports noted minor issues that were immediately addressed by Bates as part of their ongoing erosion control maintenance. Sediment migration beyond the limit of Work from prior rain events outside the reporting period was noted during the April 17th and April 24th inspections; this area was remediated prior to the May 1st inspection.

Deviations from project approvals noted:

There were no deviations from project approvals during this reporting period.

Administrative Consent Order Schedule:

The Town entered into an Administrative Consent Order (ACO) with the MassDEP on November 29, 2022, to complete remaining landfill closure activities at the Ledge Road Landfill. The ACO requires that the landfill cap be substantially complete by June 30, 2025, and submission of a category BWP SW43 "Landfill Closure Completion" for the certification of closure construction by November 1, 2025. It is currently anticipated that the project will be completed in accordance with the ACO schedule.

Photographs documenting the construction progress are attached.

Certification

I, Nathan E. Jones, attest under the pains and penalties of perjury that:

(a) I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification statement;

(b) based on my inquiry of those persons responsible for obtaining the information, the information contained in this submittal is, to the best of my knowledge, true, accurate, and complete;

(c) I am fully authorized to bind the entity required to submit these documents and to make this attestation on behalf of such entity; and

(d) I am aware that there are significant penalties, including, but not limited to, possible administrative and civil penalties for submitting false, inaccurate, or incomplete information and possible fines and imprisonment for knowingly submitting false, inaccurate, or incomplete information.

Please do not hesitate to contact me at (617) 452-6563 if you have any questions or need anything further.

Very truly yours,

Nathan E. Jones, P.E., PMP
Project Manager
CDM Smith Inc.

Attachments
- Photographs

c: Richard Spieler, John Morey, and Karen Stromberg, MassDEP
Chris Cronin and Carlos Jaquez, Town of Andover
Myles Johnson, CDM Smith

18-in drainage alignment facing Greenwood Road – 04/01/2024

Additional erosion controls delivered to site for maintenance – 04/01/2024

Drain manhole upstream of outfall, installed with 18-in RCP upstream – 04/01/2024

18-in drain installation ongoing in easement south of southern edge of landfill – 04/02/2024

Trenching for 18-in drain installation – 04/02/2024

Erosion control repairs at western edge of limit of work – 04/02/2024

Remote control compactor utilized in 18-in drain trench excavation – 04/02/2024

Installation of 18-in drain and remote control compactor utilized in trench – 04/02/2024

Wetlands stream bed materials of washed stone and sand stockpiles – 04/02/2024

General landfill view, facing Chandler Road after overnight snow event – 04/05/2024

Truck delivery of loam and compost to site for landfill cap – 04/08/2024

View of sand stockpiled on site, facing Greenwood Road – 04/08/2024

Excavation for installation of separator unit next to Greenwood Road – 04/10/2024

Excavation for installation of separator drain manhole – 04/10/2024

HDPE pipe replacement for failing corrugated metal pipe in wetlands stream bed – 04/10/2024

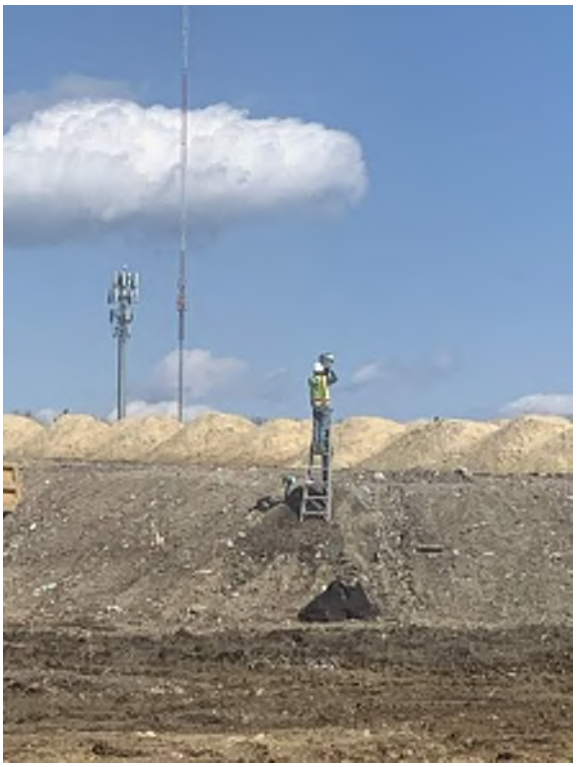
Interceptor unit installation – 04/10/2024

View of drain work ongoing adjacent to Greenwood Road – 04/10/2024

Horizontal gas collection trench including 6-in perforated piping installation – 04/15/2024

Horizontal gas collection trench backfill ongoing – 04/15/2024

Joining horizontal perforated gas collection piping 2-part glue application – 04/15/2024



Wind-driven turbine ventilator installation on passive landfill gas trench vent – 04/15/2024

Ongoing horizontal gas collection trench installation – 04/15/2024

Wetlands streams restoration work ongoing – 04/15/2024

Compaction equipment utilized on site – 04/16/2024

Horizontal gas collection trench installation at southern edge of landfill – 04/16/2024

Loam hauled to site for screening and compost addition – 04/16/2024

Test pits in Greenwood Road for water and gas utilities – 04/18/2024

Stockpile of tires from gas vent trench excavation – 04/18/2024

Backfill to landfill sub grade over horizontal gas collection trench – 04/22/2024

Drainage trenching approaches Greenwood Road – 04/22/2024

Sand backfill around 8-in gas main in Greenwood Road – 04/22/2024

Warning tape installed over existing 8-in gas main sand backfill on Greenwood Road – 04/22/2024

Drain manhole installed in Greenwood Road – 04/23/2024

Water truck deployed for site dust control – 04/23/2024

Catch Basin installation with connection to drain manhole in Greenwood Road – 04/24/2024

18-in RCP drain under gas main and over water main on Greenwood Road – 04/25/2024

Dust control truck and loam screening equipment in operation – 04/25/2024

Greenwood Road drainage installation with traffic control – 04/25/2024

Greenwood Road traffic control with alternating direction flow – 04/25/2024

Loam and compost deliveries continue to site – 04/25/2024

Loam screening equipment in operation – 04/25/2024

Sand backfill at gas main crossing on Greenwood Road – 04/25/2024

Greenwood Road catch basin sump base section installed – 04/29/2024

Greenwood Road east side catch basin installation excavation – 04/29/2024

Facing north on Greenwood Road, traffic maintained on temporary roadway – 04/29/2024

Facing south on Greenwood Road, drain work with traffic flow on temporary roadway – 04/29/2024

Sideline roadway constructed to allow traffic without shutting the road down – 04/29/2024

Traffic flow maintained with side road for catch basin installation on Greenwood Road – 04/29/2024

15-in RCP drain tied into existing drain manhole in Greenwood Road – 04/30/2024

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June 18, 2024

Mr. Mark Fairbrother
Section Chief, Solid Waste Management
Massachusetts Department of Environmental Protection
Northeast Regional Office
150 Presidential Way
Woburn, Massachusetts 01801

Subject: Construction Monitoring Report No. 9
Ledge Road Landfill Closure
Town of Andover, Massachusetts
BWP SW11 Landfills - Authorization Number SW11AC-0000027

Dear Mr. Fairbrother:

On behalf of the Town of Andover (the Town), CDM Smith Inc. (CDM Smith) has prepared this Construction Monitoring Report No. 9 for the Ledge Road Landfill Closure Project. This report has been prepared to comply with Conditions 5c and 14d of the Massachusetts Department of Environmental Protection (MassDEP) approval dated May 16, 2023. This report covers the period May 1 – May 31, 2024.

Mr. Myles Johnson of CDM Smith performed full-time construction monitoring during the reporting period and maintained the Daily Construction Activity Log. Mr. Nathan Jones of CDM Smith performed one periodic inspection during the reporting period on May 1, 2024.

Summary of work completed during the reporting period

- J. Bates & Son LLC (Bates) continued site grading and compaction. Landfill shaping and grading are nearly complete. Final grade adjustments ongoing
- Erosion control installation and maintenance was completed throughout the month by S&M Farms Inc. (S&M), Bates' erosion control subcontractor.
- Bates' subcontractor, Hydrograss Technologies North Oxford, MA, completed planting of trees and shrubs in wetland replication area and for the restoration of wetland hotspot excavation areas. Hydrograss also installed live stakes for stream bank restoration. It was determined in early June that the grading in the wetland replication area needed to be adjusted to improve the hydrology.
- Greenwood Road drainage trench paving repair was completed during the week of May 6th.
- The installation of the southern gas vent trench was completed during the week of May 6th.

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- Deliveries of gas vent sand continued throughout the month of May.

Construction activity look ahead:

- In early June, Hydrograss will remove plantings in the wetland replication area, Bates will regrade the area to improve the hydrology, and then Hydrograss will replace the plantings.
- Sand for the gas vent layer will continue to be delivered.
- Shaping of the stormwater detention basins will continue throughout June.
- LLDPE liner installation will commence during the second week in June.

Weather events during the reporting period (greater than one inch precipitation):

- 1.34 inches of precipitation were recorded on May 30th.

Items inspected to be in conformance with project approvals:

- Erosion controls were inspected by the Environmental Monitor on May 1st, May 8th, May 15th, May 22nd, and May 29th. The reports on May 1st, 8th, and 15th noted maintenance that was required for erosion site controls downstream of wetland excavation area 5. This was addressed before the May 22nd inspection.

Deviations from project approvals noted:

There were no deviations from project approvals during this reporting period.

Administrative Consent Order Schedule:

The Town entered into an Administrative Consent Order (ACO) with the MassDEP on November 29, 2022, to complete remaining landfill closure activities at the Ledge Road Landfill. The ACO requires that the landfill cap be substantially complete by June 30, 2025, and submission of a category BWP SW43 "Landfill Closure Completion" for the certification of closure construction by November 1, 2025. It is currently anticipated that the project will be completed in accordance with the ACO schedule.

Photographs documenting the construction progress are attached.

Certification

I, Nathan E. Jones, attest under the pains and penalties of perjury that:

(a) I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification statement;

(b) based on my inquiry of those persons responsible for obtaining the information, the information contained in this submittal is, to the best of my knowledge, true, accurate, and complete;

(c) I am fully authorized to bind the entity required to submit these documents and to make this attestation on behalf of such entity; and

(d) I am aware that there are significant penalties, including, but not limited to, possible administrative and civil penalties for submitting false, inaccurate, or incomplete information and possible fines and imprisonment for knowingly submitting false, inaccurate, or incomplete information.

Please do not hesitate to contact me at (617) 452-6563 if you have any questions or need anything further.

Very truly yours,

Nathan E. Jones, P.E., PMP
Project Manager
CDM Smith Inc.

Attachments
- Photographs

c: Richard Spieler, John Morey, and Karen Stromberg, MassDEP
Chris Cronin and Carlos Jaquez, Town of Andover
Myles Johnson, CDM Smith

Ledge Road Landfill Closure – Construction Monitoring Report No. 9
Photos

Delivery of gas venting sand to site – 05/01/2024

Restored stream bank growth – 05/01/2024

Catch Basin lateral trench temporary pavement patch – 05/02/2024

Greenwood Road drainage improvement – 05/02/2024

Growth observed on restored stream banks – 05/06/2024

Trees stockpiled for planting in wetland replication area – 05/06/2024

General Site view from southwest corner – 05/07/2024

Compaction along southern edge of landfill – 05/07/2024

Hot mix asphalt trench paving on Greenwood Road drain alignment – 05/09/2024

Excavation at northwest corner of landfill for detention basin – 05/13/2024

Grading at southeast corner of landfill - 05/13/2024

Trees planted in wetland excavation area 5 – 05/13/2024

Grading and compaction of detention basin – 05/14/2024

Hot mix asphalt paving at Greenwood Road – 05/15/2024

Trees planted for restoration in wetland excavation area 7 – 05/16/2024

Wetland replication tree planting – 5/17/2024

Screening of loam and mixing with compost – 05/20/2024

Sand stockpiles on landfill plateau – 5/20/2024

Former Pettingill driveway with pavement removed – 05/20/2024

Grading of eastern stormwater detention basin – 05/21/2024

Loam installed at location of former Pettingill driveway – 05/21/2024

Tires being removed from site – 05/22/2024

Dust suppression by water truck – 05/22/2024

Final grading of eastern detention basin 5/23/2024

Growth observed on restored stream banks with live stakes installed – 05/23/2024

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July 17, 2024

Mr. Mark Fairbrother
Section Chief, Solid Waste Management
Massachusetts Department of Environmental Protection
Northeast Regional Office
150 Presidential Way
Woburn, Massachusetts 01801

Subject: Construction Monitoring Report No. 10
Ledge Road Landfill Closure
Town of Andover, Massachusetts
BWP SW11 Landfills - Authorization Number SW11AC-0000027

Dear Mr. Fairbrother:

On behalf of the Town of Andover (the Town), CDM Smith Inc. (CDM Smith) has prepared this Construction Monitoring Report No. 10 for the Ledge Road Landfill Closure Project. This report has been prepared to comply with Conditions 5c and 14d of the Massachusetts Department of Environmental Protection (MassDEP) approval dated May 16, 2023. This report covers the period June 1 – June 30, 2024.

Mr. Myles Johnson of CDM Smith performed full-time construction monitoring during the reporting period and maintained the Daily Construction Activity Log. Mr. Nathan Jones of CDM Smith performed four periodic inspections during the reporting period on June 5, 12, 14, and 27, 2024.

Summary of work completed during the reporting period

- J. Bates & Son LLC (Bates) continued final grade adjustments.
- Erosion control maintenance was completed throughout the month by S&M Farms Inc. (S&M), Bates' erosion control subcontractor.
- Bates' subcontractor, Hydrograss Technologies North Oxford, MA, removed plantings within the wetland replication area so that Bates could adjust grades to improve hydrology; Hydrograss then returned to the site and replaced the plantings.
- Bates continued to install coarse sand gas venting layer. CDM Smith witnessed test pits to confirm depths as sand installation progressed.
- Bates' subcontractor New England Liner began the installation of GCL and LLDPE liner on June 12th. GCL installation is complete. Approximately 50% of the LLDPE liner was installed through June 28th when New England Liner temporarily demobilized from the site.

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- Bates began installation of sand drainage and vegetative support layers.
- Bates began shaping of the stormwater detention basins.
- Deliveries of gas vent and drainage sand continued throughout the month of June.

Construction activity look ahead:

- Sand for the gas vent and drainage layers will continue to be delivered.
- Shaping of the stormwater detention basins will be completed in July.
- Installation of gas venting layer will continue. Installation of sand drainage and vegetative support layers will continue in areas where liner installation is complete.
- Installation of the anchor trench stone toe drain will begin in July.
- LLDPE liner installation will resume in mid-July.
- Hydrograss will hydroseed portions of vegetative support layer that are complete, once at least three acres have been prepared. Erosion control matting will be installed following hydroseeding on slopes greater the 4 vertical to 1 horizontal.

Weather events during the reporting period (greater than one inch precipitation):

- There were no precipitation events greater than one inch recorded during the month of June.

Items inspected to be in conformance with project approvals:

- Erosion controls were inspected by the Environmental Monitor on June 6th, June 13th, June 19th, and June 26th. All reports noted minor issues, which were addressed throughout the month.

Deviations from project approvals noted:

There were no deviations from project approvals during this reporting period.

Administrative Consent Order Schedule:

The Town entered into an Administrative Consent Order (ACO) with the MassDEP on November 29, 2022, to complete remaining landfill closure activities at the Ledge Road Landfill. The ACO requires that the landfill cap be substantially complete by June 30, 2025, and submission of a category BWP SW43 “Landfill Closure Completion” for the certification of closure construction by November 1, 2025. It is currently anticipated that the project will be completed in accordance with the ACO schedule.

Photographs documenting the construction progress are attached.

Certification

I, Nathan E. Jones, attest under the pains and penalties of perjury that:

(a) I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification statement;

(b) based on my inquiry of those persons responsible for obtaining the information, the information contained in this submittal is, to the best of my knowledge, true, accurate, and complete;

(c) I am fully authorized to bind the entity required to submit these documents and to make this attestation on behalf of such entity; and

(d) I am aware that there are significant penalties, including, but not limited to, possible administrative and civil penalties for submitting false, inaccurate, or incomplete information and possible fines and imprisonment for knowingly submitting false, inaccurate, or incomplete information.

Please do not hesitate to contact me at (617) 452-6563 if you have any questions or need anything further.

Very truly yours,

Nathan E. Jones, P.E., PMP
Project Manager
CDM Smith Inc.

Attachments
- Photographs

c: Richard Spieler, John Morey, and Karen Stromberg, MassDEP
Chris Cronin and Carlos Jaquez, Town of Andover
Myles Johnson, CDM Smith

Delivery 40ml LLDPE liner on site – 06/03/2024

LLDPE liner rolls off-loading at site – 06/03/2024

New England Lining crew preparing for liner installation work – 06/03/2024

Landfill site facing southeast corner of landfill from Greenwood Road – 06/04/2024

Riprap stockpiled on site – 06/04/2024

Water truck utilized for dust control – 06/04/2024

Southern edge gas vent pipe trench with vents facing east – 06/05/2024

32-foot-wide rolls of 40ml LLDPE liner stored on site – 06/06/2024

Sand deliveries to site – 06/06/2024

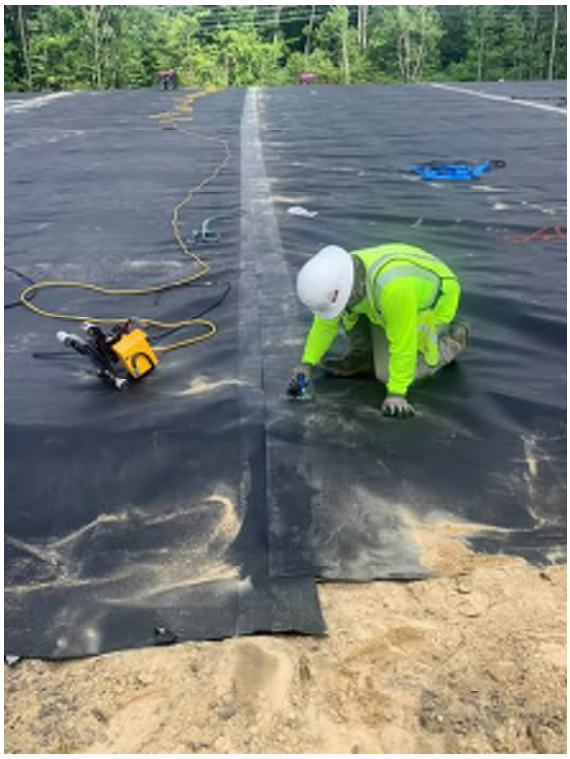
Sand stockpiled on site – 06/07/2024

6-inch vent sand layer installation starting at northwest corner of landfill site – 06/10/2024

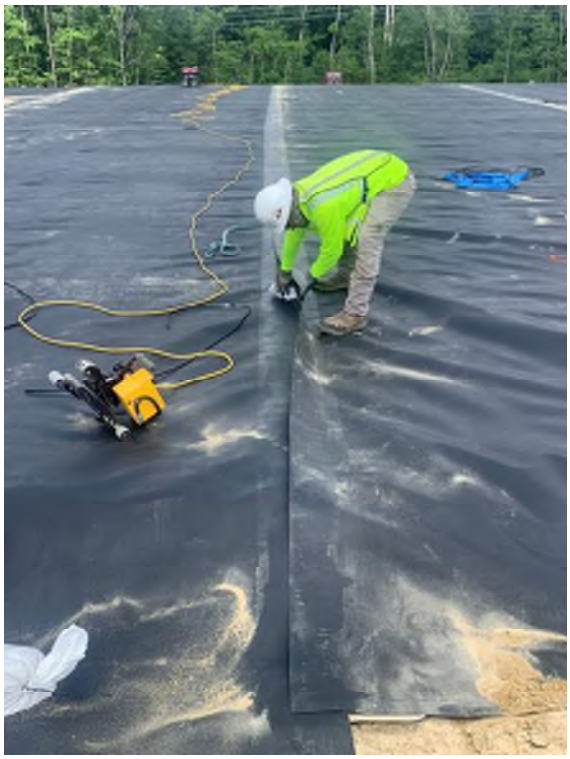
Survey to confirm the depth of vent under sand layer – 06/11/2024

LLDPE liner installation – 06/12/2024

Seam testing with pressure gauge – 06/12/2024



QA/QC of liner installation – 06/12/2024



Seaming of liner – 06/12/2024

Seam Fusion Welding – 06/12/2024

Wetlands replication area regrading – 06/12/2024

LLDPE Liner Installation – 06/13/2024

Preparing subgrade for gas venting sand installation – 06/13/2024

Seam welding liner on slope – 06/13/2024

LLDPE liner installation – 06/15/2024

Anchor trench at toe of slope for liner installation – 06/14/2024

Excavation for liner anchor trench – 06/14/2024

Gas vent boot installed – 06/14/2024

Installation of boot on gas vent – 06/14/2024

Liner installation with temporary anchor trench on the landfill plateau – 06/14/2024

Liner patch QA/QC notations – 06/14/2024

Extrusion welding liner at gas vent penetration connection – 06/14/2024

Grading western slope with 6-inch vent sand layer – 06/17/2024

Anchor trench excavation adjacent to new drainage outfall at southwest corner of landfill – 06/18/2024

Installation of GCL – 06/19/2024

Installation of GCL – 06/19/2024

Start of GCL installation ahead of LLDPE liner – 06/19/2024

Live stakes growing in wetlands areas – 06/19/2024

View of landfill from southwest corner – 06/19/2024

Wetland replication area complete – 06/19/2024

18-inch profile drains on top of LLDPE liner – 06/20/2024

Installation of GCL – 06/20/2024

Installation of GCL – 06/20/2024

View of landfill from Greenwood Road – 06/20/2024

View of landfill facing north from Greenwood Road – 06/20/2024

Western slope of landfill facing wetlands – 06/20/2024

Excavation of anchor trench at southeast corner of landfill – 06/24/2024

Start of installation of 12-inch sand drainage layer over liner – 06/24/2024

Installation of GCL and LLDPE liner at southern edge of landfill – 06/25/2024

Liner spot repair work – 06/25/2024

Loam being moved from stockpile to cover top of landfill – 06/25/2024

Stream bank restoration growth – 06/26/2024

Northern detention basin grading – 06/26/2024

Southwestern slope facing wetlands area – 06/26/2024

View of landfill from Greenwood Road – 06/26/2024

Water truck utilized for dust control – 06/26/2024

Installation of GCL in detention basin – 06/27/2024

Spreading of gas vent sand in detention basin – 06/27/2024

Eastern detention basin with LLDPE liner installed – 06/28/2024

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August 15, 2024

Mr. Mark Fairbrother
Section Chief, Solid Waste Management
Massachusetts Department of Environmental Protection
Northeast Regional Office
150 Presidential Way
Woburn, Massachusetts 01801

Subject: Construction Monitoring Report No. 11
Ledge Road Landfill Closure
Town of Andover, Massachusetts
BWP SW11 Landfills - Authorization Number SW11AC-0000027

Dear Mr. Fairbrother:

On behalf of the Town of Andover (the Town), CDM Smith Inc. (CDM Smith) has prepared this Construction Monitoring Report No. 11 for the Ledge Road Landfill Closure Project. This report has been prepared to comply with Conditions 5c and 14d of the Massachusetts Department of Environmental Protection (MassDEP) approval dated May 16, 2023. This report covers the period July 1 – July 31, 2024.

Mr. Myles Johnson of CDM Smith performed full-time construction monitoring during the reporting period and maintained the Daily Construction Activity Log. Mr. Nathan Jones of CDM Smith performed one periodic inspection during the reporting period on July 11, 2024.

Summary of work completed during the reporting period

- J. Bates & Son LLC (Bates) continued final grade adjustments.
- Bates completed maintenance of erosion controls throughout the month.
- Adjustments continued to be made to the wetland replication area to optimize hydrology.
- Bates continued to install coarse sand gas venting layer. CDM Smith witnessed test pits to confirm depths installation progressed.
- Bates' subcontractor New England Liner continued the installation of LLDPE liner. Approximately 80-85% of the LLDPE liner was completed by the end of the month.
- Bates continued installation of sand drainage and vegetative support layers. CDM Smith witnessed test pits to confirm depths installation progressed.

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- Bates continued shaping of the stormwater detention basins.
- Bates installed rip rap toe drain along the western edge of the landfill.
- Deliveries of gas vent and drainage sand continued throughout the month of July.

Construction activity look ahead:

- Sand for the gas vent and drainage layers will continue to be delivered.
- Shaping of the stormwater detention basins will be completed in August.
- Installation of gas venting layer will continue. Installation of sand drainage and vegetative support layers will continue in areas where liner installation is complete.
- Installation of the anchor trench stone toe drain will continue in August.
- LLDPE liner installation will be completed in August.
- Hydrograss will hydroseed portions of vegetative support layer that are complete, once at least three acres have been prepared. Erosion control matting will be installed following hydroseeding on slopes greater the 4 vertical to 1 horizontal.

Weather events during the reporting period (greater than one inch precipitation):

- There were no precipitation events greater than one inch recorded during the month of July.

Items inspected to be in conformance with project approvals:

- Erosion controls were inspected by the Environmental Monitor on July 10th, July 17th, July 25th, and July 31st. All reports noted minor issues, which were addressed throughout the month or will be addressed during normal erosion control maintenance.

Deviations from project approvals noted:

There were no deviations from project approvals during this reporting period.

Administrative Consent Order Schedule:

The Town entered into an Administrative Consent Order (ACO) with the MassDEP on November 29, 2022, to complete remaining landfill closure activities at the Ledge Road Landfill. The ACO requires that the landfill cap be substantially complete by June 30, 2025, and submission of a category BWP SW43 “Landfill Closure Completion” for the certification of closure construction by November 1, 2025. It is currently anticipated that the project will be completed in accordance with the ACO schedule.

Photographs documenting the construction progress are attached.

WATER + ENVIRONMENT + TRANSPORTATION + ENERGY + FACILITIES

Certification

I, Nathan E. Jones, attest under the pains and penalties of perjury that:

(a) I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification statement;

(b) based on my inquiry of those persons responsible for obtaining the information, the information contained in this submittal is, to the best of my knowledge, true, accurate, and complete;

(c) I am fully authorized to bind the entity required to submit these documents and to make this attestation on behalf of such entity; and

(d) I am aware that there are significant penalties, including, but not limited to, possible administrative and civil penalties for submitting false, inaccurate, or incomplete information and possible fines and imprisonment for knowingly submitting false, inaccurate, or incomplete information.

Please do not hesitate to contact me at (617) 452-6563 if you have any questions or need anything further.

Very truly yours,

Nathan E. Jones, P.E., PMP
Project Manager
CDM Smith Inc.

Attachments
- Photographs

c: Richard Spieler, John Morey, and Karen Stromberg, MassDEP
Chris Cronin and Carlos Jaquez, Town of Andover
Myles Johnson, CDM Smith

Ledge Road Landfill Closure – Construction Monitoring Report No. 11
Photos

Installation of toe drain – 07/01/2024

General progress viewed from Greenwood Road – 07/02/2024

Toe drain west edge of landfill facing south – 07/02/2024

Construction of gravel maintenance road at southwest corner of landfill – 07/03/2024

Installation of toe drain on western edge anchor – 07/03/2024

Sand deliveries to site continue – 07/03/2024

Construction progress viewed facing north from southwest corner of site – 07/08/2024

Shaping west slope grass drainage swale – 07/08/2024

Sand pile being distributed on site – 07/09/2024

Site entrance maintenance – 07/10/2024

Test pits confirming material depth – 07/11/2024

Drainage channel installed in wetland replication area to improve hydrology – 07/11/2024

Grass swale on western edge formed – 07/11/2024

Site progress viewed from Greenwood Road – 07/15/2024

Liner crew welding swale flap to liner – 07/18/2024

Test pit completed to confirm sand thickness – 07/19/2024

LLDPE liner installation at western side of landfill plateau – 07/22/2024

Sand and loam installation over GCL and LLDPE liners at double-lined wetland basin – 07/23/2024

Riprap toe drain and liner flap for grass storm water swale on western side of landfill – 07/24/2024

Landfill plateau LLDPE liner installation – 07/29/2024

Liner installation continued – 07/30/2024

Liner with 18-inch flat panel underdrain pipe being installed – 07/31/2024

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September 16, 2024

Mr. Mark Fairbrother
Section Chief, Solid Waste Management
Massachusetts Department of Environmental Protection
Northeast Regional Office
150 Presidential Way
Woburn, Massachusetts 01801

Subject: Construction Monitoring Report No. 12
Ledge Road Landfill Closure
Town of Andover, Massachusetts
BWP SW11 Landfills - Authorization Number SW11AC-0000027

Dear Mr. Fairbrother:

On behalf of the Town of Andover (the Town), CDM Smith Inc. (CDM Smith) has prepared this Construction Monitoring Report No. 12 for the Ledge Road Landfill Closure Project. This report has been prepared to comply with Conditions 5c and 14d of the Massachusetts Department of Environmental Protection (MassDEP) approval dated May 16, 2023. This report covers the period August 1 – August 31, 2024.

Mr. Myles Johnson of CDM Smith performed full-time construction monitoring during the reporting period and maintained the Daily Construction Activity Log. Mr. Nathan Jones of CDM Smith performed one periodic inspection during the reporting period on August 7, 2024.

Summary of work completed during the reporting period

- Bates completed maintenance of erosion controls throughout the month.
- The wetland replication area continued to be monitored following grade adjustments completed to improve hydrology.
- Bates continued to install coarse sand gas venting layer. CDM Smith witnessed test pits to confirm depths installation progressed.
- Bates' subcontractor New England Liner continued the installation of LLDPE liner. Approximately 85-90% of the LLDPE liner was completed by the end of the month.
- Bates continued installation of sand drainage and vegetative support layers. CDM Smith witnessed test pits to confirm depths installation progressed.

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- Bates' subcontractor, Hydrograss Technologies of North Oxford, MA, hydroseeded the western and southern side slopes and some of the landfill plateau.
- Bates continued shaping of the stormwater detention basins.
- Bates installed the rip rap drainage swale along the eastern slope of the landfill.
- Bates began installation of the northern landfill gas venting trench. Bedrock was encountered shallower than anticipated in a portion of the trench.
- Deliveries of sand continued throughout the month of August.

Construction activity look ahead:

- Sand will continue to be delivered to the site as needed.
- Installation of the stormwater detention basin inlet structures, outlet structures, and articulated concrete block matting will begin in September.
- Installation of gas vent sand and LLDPE liner will be completed. Installation of sand drainage and vegetative support layers will continue in areas where liner installation is complete.
- Installation of the anchor trench stone toe drain will be continued in September.
- LLDPE liner installation will be completed in September.
- Hydrograss will continue to hydroseed portions of vegetative support layer that are complete, once at least three acres have been prepared. Erosion control matting will be installed following hydroseeding on slopes greater the 4 vertical to 1 horizontal.
- Construction of the northern landfill gas venting trench will be completed.

Weather events during the reporting period (greater than one inch precipitation):

- 1.16 inches of rain were recorded on August 4th.
- 1.21 inches of rain were recorded on August 19th.

Items inspected to be in conformance with project approvals:

- Erosion controls were inspected by the Environmental Monitor on August 7th, August 14th, August 21st, and August 28th. Some minor outstanding items have been noted, including erosion control maintenance near the northwestern limit of work, removal of escaped sediment at the wetland removal area 4 outlet, and reinstallation of erosion site controls along wetland removal area 7, where the access road and southern stormwater detention basin were being built up.

Deviations from project approvals noted:

There were no deviations from project approvals during this reporting period.

Administrative Consent Order Schedule:

The Town entered into an Administrative Consent Order (ACO) with the MassDEP on November 29, 2022, to complete remaining landfill closure activities at the Ledge Road Landfill. The ACO requires that the landfill cap be substantially complete by June 30, 2025, and submission of a category BWP SW43 "Landfill Closure Completion" for the certification of closure construction by November 1, 2025. It is currently anticipated that the project will be completed in accordance with the ACO schedule.

Photographs documenting the construction progress are attached.

Certification

I, Nathan E. Jones, attest under the pains and penalties of perjury that:

(a) I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification statement;

(b) based on my inquiry of those persons responsible for obtaining the information, the information contained in this submittal is, to the best of my knowledge, true, accurate, and complete;

(c) I am fully authorized to bind the entity required to submit these documents and to make this attestation on behalf of such entity; and

(d) I am aware that there are significant penalties, including, but not limited to, possible administrative and civil penalties for submitting false, inaccurate, or incomplete information and possible fines and imprisonment for knowingly submitting false, inaccurate, or incomplete information.

Please do not hesitate to contact me at (617) 452-6563 if you have any questions or need anything further.

Very truly yours,

Nathan E. Jones, P.E., PMP
Project Manager
CDM Smith Inc.

Attachments
- Photographs

c: Richard Spieler, John Morey, and Karen Stromberg, MassDEP
Chris Cronin and Carlos Jaquez, Town of Andover
Myles Johnson, CDM Smith

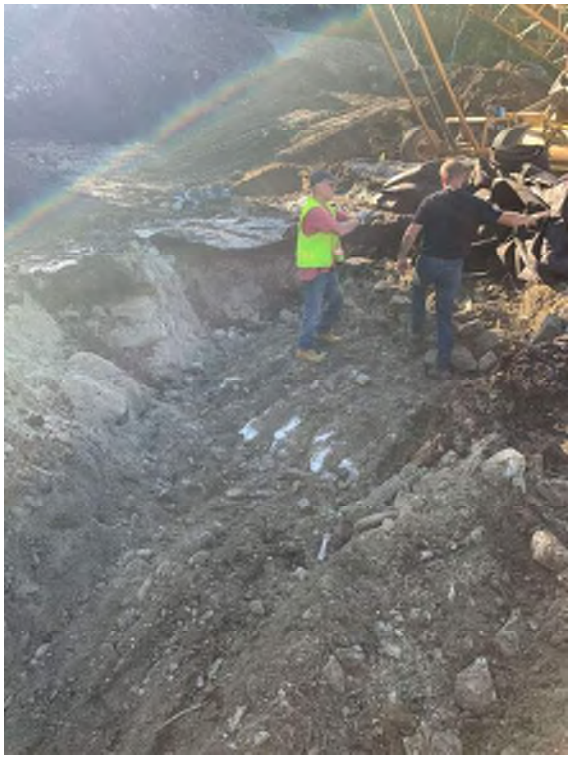
Construction progress viewed from Greenwood Road – 08/01/2024

Wetland Replication Area growth - 08/05/2024

Sand drainage layer installation progress– 08/07/2024

Sand drainage layer installation progress– 08/07/2024

Construction progress viewed from Greenwood Road – 08/12/2024



Bedrock encountered at northeastern edge of landfill in northern gas vent trench – 08/13/2024

Hydroseed application – 08/13/2024

Hydroseed application – 08/13/2024

Hydroseed application – 08/13/2024

Wetland Replication Area growth – 08/13/2024

Installation of gas vent trench with perforated pipe – 08/14/2024

Installation of gas vent trench with perforated pipe – 08/14/2024

Landfill plateau looking south – 08/14/2024

Landfill plateau looking north – 08/14/2024

LLDPE Liner flap for rip rap drainage swale – 08/16/2024

Hydroseed growth observed on landfill plateau – 08/21/2024

Installation of LLDPE Liner flap of rip rap drainage swale – 08/21/2024

Loam screening – 08/21/2024

Construction progress viewed from Greenwood Road – 08/23/2024

Sand deliveries continuing throughout month – 8/26/2024

Site dust control with water truck – 08/27/2024

Hydroseed growth observed on landfill plateau – 08/28/2024

Rip rap drainage swale under construction – 08/28/2024

Wetland Replication Area growth – 08/28/2024

Hydroseed grass growth on western slope of landfill – 08/29/2024

Construction progress viewed from Greenwood Road – 08/30/2024

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October 24, 2024

Mr. Mark Fairbrother
Section Chief, Solid Waste Management
Massachusetts Department of Environmental Protection
Northeast Regional Office
150 Presidential Way
Woburn, Massachusetts 01801

Subject: Construction Monitoring Report No. 13
Ledge Road Landfill Closure
Town of Andover, Massachusetts
BWP SW11 Landfills - Authorization Number SW11AC-0000027

Dear Mr. Fairbrother:

On behalf of the Town of Andover (the Town), CDM Smith Inc. (CDM Smith) has prepared this Construction Monitoring Report No. 13 for the Ledge Road Landfill Closure Project. This report has been prepared to comply with Conditions 5c and 14d of the Massachusetts Department of Environmental Protection (MassDEP) approval dated May 16, 2023. This report covers the period September 1 – September 30, 2024.

Mr. Myles Johnson of CDM Smith performed full-time construction monitoring during the reporting period and maintained the Daily Construction Activity Log. Mr. Nathan Jones of CDM Smith performed one periodic inspection during the reporting period on September 4, 2024.

Summary of work completed during the reporting period

- Bates completed maintenance of erosion controls throughout the month.
- The hydrology of the wetland replication area continued to be monitored.
- Bates continued to install coarse sand gas venting layer. CDM Smith witnessed test pits to confirm depths installation progressed.
- Bates' subcontractor New England Liner continued the installation of LLDPE liner. Approximately 90-95% of the LLDPE liner was completed by the end of the month.
- Bates continued installation of sand drainage and vegetative support layers. CDM Smith witnessed test pits to confirm depths installation progressed.
- Bates' subcontractor, Hydrograss Technologies of North Oxford, MA, hydroseeded the eastern landfill plateau and the eastern stormwater basin.

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- Bates completed the shaping of the double-lined wetland area and southern stormwater detention basin and continued shaping of the northern stormwater detention basin.
- Bates installed the rip rap drainage swale along the eastern slope of the landfill.
- Deliveries of sand continued throughout the month of August.

Construction activity look ahead:

- Sand delivery to continue as needed until installation of gas venting and sand drainage layers are complete.
- Installation of the stormwater detention basin inlet structures, outlet structures, and articulated concrete block matting will be completed in October.
- Installation of gas vent sand and LLDPE liner will be completed in October. Installation of sand drainage and vegetative support layers will continue in areas where liner installation is complete.
- Installation of the anchor trench stone toe drain will be continued in October.
- Hydrograss will continue to hydroseed portions of vegetative support layer that are complete. Erosion control matting will be installed following hydroseeding on slopes greater than 4 vertical to 1 horizontal.
- Construction of the eastern landfill gas venting trench will be completed.

Weather events during the reporting period (greater than one inch precipitation):

- There were no precipitation events greater than one inch during the month of September.

Items inspected to be in conformance with project approvals:

- Erosion controls were inspected by the Environmental Monitor on September 4th, September 11th, September 17th, and September 27th. Some minor outstanding items have been noted, including erosion control maintenance near the northwestern limit of work, removal of escaped sediment at the wetland removal area 4 outlet, and reinstallation of erosion site controls along wetland removal area 7, where the access road and southern stormwater detention basin were being built up.

Deviations from project approvals noted:

There were no deviations from project approvals during this reporting period.

Administrative Consent Order Schedule:

The Town entered into an Administrative Consent Order (ACO) with the MassDEP on November 29, 2022, to complete remaining landfill closure activities at the Ledge Road Landfill. The ACO requires that the landfill cap be substantially complete by June 30, 2025, and submission of a category BWP SW43 "Landfill Closure Completion" for the certification of closure construction by November 1, 2025. It is currently anticipated that the project will be completed in accordance with the ACO schedule.

Photographs documenting the construction progress are attached.

Certification

I, Nathan E. Jones, attest under the pains and penalties of perjury that:

(a) I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification statement;

(b) based on my inquiry of those persons responsible for obtaining the information, the information contained in this submittal is, to the best of my knowledge, true, accurate, and complete;

(c) I am fully authorized to bind the entity required to submit these documents and to make this attestation on behalf of such entity; and

(d) I am aware that there are significant penalties, including, but not limited to, possible administrative and civil penalties for submitting false, inaccurate, or incomplete information and possible fines and imprisonment for knowingly submitting false, inaccurate, or incomplete information.

Please do not hesitate to contact me at (617) 452-6563 if you have any questions or need anything further.

Very truly yours,

Nathan E. Jones, P.E., PMP
Project Manager
CDM Smith Inc.

Attachments
- Photographs

c: Richard Spieler, John Morey, and Karen Stromberg, MassDEP
Chris Cronin and Carlos Jaquez, Town of Andover
Myles Johnson, CDM Smith

Hydroseed grass growth on plateau looking south – 09/03/2024

Loam screening – 09/03/2024

Hydroseed growth on western slope – 09/04/2024

Areas above rip-rap drainage swale prepped for hydroseed – 09/04/2024

Final grading of finish loam at eastern edge of landfill – 09/04/2024

On site loam screening and relocation of stockpile – 09/04/2024

Construction progress viewed from Greenwood Road – 09/05/2024

Grading northern stormwater berm basin embankment and access road – 09/06/2024

Hyrdroseed application on eastern side of landfill plateau – 09/06/2024

Construction progress viewed from Greenwood Road – 09/10/2024

Wetland Replication area growth – 09/10/2024

Gas venting sand installation in preparation of LLDPE liner installation – 09/11/2024

Compaction and finish grading of subgrade – 09/11/2024

Western maintenance road construction – 09/11/2024

Western slope grass swale with hydroseed growth – 09/11/2024

LLDPE liner installation – 09/17/2024

LLDPE liner seaming – 09/17/2024

Precast concrete outlet structure installation in nortthern detention basin – 09/18/2024

Installation of southern stormwater basin concrete outlet control structure with check dam – 09/19/2024

Installation of 18-inch underdrain over LLDPE liner – 09/23/2024

Construction of northern stormwater detention basin and access road – 09/23/2024

Final grading of southern stormwater detention basin completed – 09/25/2024

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November 15, 2024

Mr. Mark Fairbrother
Section Chief, Solid Waste Management
Massachusetts Department of Environmental Protection
Northeast Regional Office
150 Presidential Way
Woburn, Massachusetts 01801

Subject: Construction Monitoring Report No. 14
Ledge Road Landfill Closure
Town of Andover, Massachusetts
BWP SW11 Landfills - Authorization Number SW11AC-0000027

Dear Mr. Fairbrother:

On behalf of the Town of Andover (the Town), CDM Smith Inc. (CDM Smith) has prepared this Construction Monitoring Report No. 14 for the Ledge Road Landfill Closure Project. This report has been prepared to comply with Conditions 5c and 14d of the Massachusetts Department of Environmental Protection (MassDEP) approval dated May 16, 2023. This report covers the period October 1 – October 31, 2024.

Mr. Myles Johnson of CDM Smith performed full-time construction monitoring during the reporting period and maintained the Daily Construction Activity Log. Mr. Nathan Jones of CDM Smith performed one periodic inspection during the reporting period on October 2, 2024.

Summary of work completed during the reporting period

- Bates completed maintenance of erosion controls throughout the month.
- Bates completed installation of coarse sand gas venting layer. CDM Smith witnessed test pits to confirm depths installation progressed.
- Bates' subcontractor New England Liner completed the installation of LLDPE liner on October 8th, 2024.
- Bates completed installation of sand drainage and vegetative support layers. CDM Smith witnessed test pits to confirm depths installation progressed.
- Bates' subcontractor, Hydrograss Technologies of North Oxford, MA, hydroseeded the northern and western areas of the landfill and other areas outside of the landfill cap. The entire landfill and all areas disturbed by construction were hydroseeded by the end of October.

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- Installation of stormwater detention basin structures, outlet structures, and articulated concrete block matting was completed in October.
- Bates' subcontractor Stafford Fence Company of Kingston replaced a fence that had been removed for construction.
- Hydrograss installed trees at the former Ledge Road site entrance off Greenwood Road to prevent access.

Construction activity look ahead:

- Bates' subcontractor Stafford Fence Company of Kingston will install gates for access roads.
- Bates will continue to demobilize equipment and personnel.
- A wooden guard rail will be installed along Chandler Road and Greenwood Road to prevent public access. The work will be completed by a third-party contractor under separate contract with the Town.
- Silt sacks will be removed from new catch basins on Greenwood Road.
- Bates' subcontractor, Geosearch of Sterling, MA will install site groundwater and landfill gas monitoring wells during the month of November.
- Erosion controls will remain in place at least through the winter.
- The project is anticipated to be substantially complete by November 30th, once monitoring well installation is complete.

Weather events during the reporting period (greater than one inch precipitation):

- There were no precipitation events greater than one inch during the month of October.

Items inspected to be in conformance with project approvals:

- Erosion controls were inspected by the Environmental Monitor on October 15th and October 30th. The reports recommend the monitoring of live stakes throughout the winter and the removal of temporary cofferdams and the plastic from the one non-compostable straw waddle that remains in the wetland area. Additionally, the report from October 30th noted that a request should be submitted to the Andover Conservation Commission for a temporary pause in inspections once 70% permanent stabilization is achieved and non-compostable erosion site controls have been removed.

Deviations from project approvals noted:

There were no deviations from project approvals during this reporting period.

Administrative Consent Order Schedule:

The Town entered into an Administrative Consent Order (ACO) with the MassDEP on November 29, 2022, to complete remaining landfill closure activities at the Ledge Road Landfill. The ACO requires that the landfill cap be substantially complete by June 30, 2025, and submission of a category BWP SW43 "Landfill Closure Completion" for the certification of closure construction by November 1, 2025. It is currently anticipated that the project will be completed in accordance with the ACO schedule.

Photographs documenting the construction progress are attached.

Certification

I, Nathan E. Jones, attest under the pains and penalties of perjury that:

(a) I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification statement;

(b) based on my inquiry of those persons responsible for obtaining the information, the information contained in this submittal is, to the best of my knowledge, true, accurate, and complete;

(c) I am fully authorized to bind the entity required to submit these documents and to make this attestation on behalf of such entity; and

(d) I am aware that there are significant penalties, including, but not limited to, possible administrative and civil penalties for submitting false, inaccurate, or incomplete information and possible fines and imprisonment for knowingly submitting false, inaccurate, or incomplete information.

Please do not hesitate to contact me at (617) 452-6563 if you have any questions or need anything further.

Very truly yours,

Nathan E. Jones, P.E., PMP
Project Manager
CDM Smith Inc.

Attachments
- Photographs

c: Richard Spieler, John Morey, and Karen Stromberg, MassDEP
Chris Cronin and Carlos Jaquez, Town of Andover
Myles Johnson, CDM Smith

Ledge Road Landfill Closure – Construction Monitoring Report No. 14
Photos

On-site loam screening completed with final sand deliveries in progress – 10/02/2024

Riprap swale and double-lined wetland basin, facing south – 10/02/2024

Wetlands Replication Area with temporary access loamed and hydro seeded – 10/03/2024

Installation of final section of LLDPE liner with seaming and testing in progress – 10/08/2024

Final section of LLDPE liner installation completed in place – 10/09/2024

North stormwater basin with articulating precast concrete surface partially installed – 10/10/2024

Hydro seeding application at northeast portion of landfill adjacent to riprap toe drain – 10/17/2024

Loam application at northern edge of landfill – 10/17/2024

Ledge Road Landfill view from Greenwood Road – 10/18/2024

Loam grading at northern edge of landfill complete and ready for hydro seeding – 10/21/2024

View of landfill facing north from 172 Greenwood Road – 10/22/2024

Loam and tree plantings along Greenwood Road on edge of landfill – 10/24/2024

Trees planted adjacent to landfill southern access road off Greenwood Road – 10/24/2024

View of landfill from Greenwood Road – 10/28/2024

Loam installed at landfill perimeter off Greenwood Road – 10/29/2024

Loam placed at outside edge of landfill from Chandler Road towards Greenwood Road – 10/29/2024

Hydro seeding of former Ledge Road outside perimeter of landfill – 10/30/2024

Hydro seed being applied to northern and western edges of landfill site – 10/30/2024

Site hydro seeding completed off Chandler Road – 10/30/2024

Replacement of fence along southern edge of landfill – 10/31/2024

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cdmsmith.com

December 18, 2024

Mr. Mark Fairbrother
Section Chief, Solid Waste Management
Massachusetts Department of Environmental Protection
Northeast Regional Office
150 Presidential Way
Woburn, Massachusetts 01801

Subject: Construction Monitoring Report No. 15
Ledge Road Landfill Closure
Town of Andover, Massachusetts
BWP SW11 Landfills - Authorization Number SW11AC-0000027

Dear Mr. Fairbrother:

On behalf of the Town of Andover (the Town), CDM Smith Inc. (CDM Smith) has prepared this Construction Monitoring Report No. 15 for the Ledge Road Landfill Closure Project. This report has been prepared to comply with Conditions 5c and 14d of the Massachusetts Department of Environmental Protection (MassDEP) approval dated May 16, 2023. This report covers the period November 1 – November 30, 2024.

Mr. Myles Johnson of CDM Smith performed construction monitoring throughout the month based on site activities during the reporting period and maintained the Daily Construction Activity Log. Mr. Nathan Jones of CDM Smith performed one periodic inspection during the reporting period on November 6, 2024.

Summary of work completed during the reporting period

- Bates' subcontractor, Geosearch, Inc. of Sterling, MA, performed monitoring well installation of gas and groundwater wells. A total of 11 groundwater monitoring wells and 14 gas monitoring wells were installed throughout the site during this effort. CDM Smith oversaw and monitor drilling operations to ensure wells were installed at desired depths for future sample programs.
- A wooden guard rail was installed along Chandler Road and Greenwood Road to prevent public access. The work was completed by a third-party contractor under a separate contract with the Town.
- Bates' subcontractor Stafford Fence Company of Kingston installed gates for access roads.
- Bates continued to demobilize equipment.
- Silt sacks were removed from new catch basins on Greenwood Road.

Construction activity look ahead:

- Erosion controls will remain in place at least through the winter.
- Bates' subcontractor, Geosearch, Inc. of Sterling, MA will return to the site to complete installation of additional monitoring wells. This work will consist of the installation of one groundwater monitoring well and eight gas monitoring wells.
- The project is anticipated to be substantially complete in early January, once monitoring well installation is complete.

Weather events during the reporting period (greater than one inch precipitation):

- There were no days with greater than one inch of precipitation during the month of November. There was one three-day (November 21-23, 2024) period with intermittent rain that totaled 2.3 inches.

Items inspected to be in conformance with project approvals:

- There was one inspection completed by the Environmental Monitor during this reporting period on November 20, 2024. The report noted that a request should be submitted to the Andover Conservation Commission for a temporary pause in inspections once 70% permanent stabilization is achieved and non-compostable erosion site controls have been removed

Deviations from project approvals noted:

There were no deviations from project approvals during this reporting period.

Administrative Consent Order Schedule:

The Town entered into an Administrative Consent Order (ACO) with the MassDEP on November 29, 2022, to complete remaining landfill closure activities at the Ledge Road Landfill. The ACO requires that the landfill cap be substantially complete by June 30, 2025, and submission of a category BWP SW43 "Landfill Closure Completion" for the certification of closure construction by November 1, 2025. It is currently anticipated that the project will be completed in accordance with the ACO schedule.

Photographs documenting the construction progress are attached.

Certification

I, Nathan E. Jones, attest under the pains and penalties of perjury that:

(a) I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification statement;

(b) based on my inquiry of those persons responsible for obtaining the information, the information contained in this submittal is, to the best of my knowledge, true, accurate, and complete;

(c) I am fully authorized to bind the entity required to submit these documents and to make this attestation on behalf of such entity; and

(d) I am aware that there are significant penalties, including, but not limited to, possible administrative and civil penalties for submitting false, inaccurate, or incomplete information and possible fines and imprisonment for knowingly submitting false, inaccurate, or incomplete information.

Please do not hesitate to contact me at (617) 452-6563 if you have any questions or need anything further.

Very truly yours,

Nathan E. Jones, P.E., PMP
Project Manager
CDM Smith Inc.

Attachments
- Photographs

c: Richard Spieler, John Morey, and Karen Stromberg, MassDEP
Chris Cronin and Carlos Jaquez, Town of Andover
Myles Johnson, CDM Smith

Drive and wash drilling – 11/05/2024

Casing installation – 11/06/2024

Facing southwest at hydro seed growth – 11/07/2024

Wetland replication area viewed from landfill – 11/07/2024

Drilling operations at CDM-3R cluster – 11/07/2024

Drilling at CDM-3MR – 11/07/2024

Wells installed at CDM-4SR & CDM-4DR – 11/07/2024

PVC of wells after installation at CDM-3MR & CDM-3SR – 11/11/2024

Guard rail installed along Greenwood St – 11/19/2024

Groundwater well installation at PZ-1R – 11/13/2024

Installation of landfill gas well – 11/15/2024

Deep bedrock groundwater monitoring well – 11/22/2024

View of landfill from Greenwood St – 11/30/2024

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cdmsmith.com

January 15, 2025

Mr. Mark Fairbrother
Section Chief, Solid Waste Management
Massachusetts Department of Environmental Protection
Northeast Regional Office
150 Presidential Way
Woburn, Massachusetts 01801

Subject: Construction Monitoring Report No. 16
Ledge Road Landfill Closure
Town of Andover, Massachusetts
BWP SW11 Landfills - Authorization Number SW11AC-0000027

Dear Mr. Fairbrother:

On behalf of the Town of Andover (the Town), CDM Smith Inc. (CDM Smith) has prepared this Construction Monitoring Report No. 16 for the Ledge Road Landfill Closure Project. This report has been prepared to comply with Conditions 5c and 14d of the Massachusetts Department of Environmental Protection (MassDEP) approval dated May 16, 2023. This report covers the period December 1 – December 31, 2024.

Construction monitoring was not performed during the month of December as there was no activity on the site. Mr. Nathan Jones of CDM Smith performed one periodic inspection during the reporting period on December 30, 2024.

Summary of work completed during the reporting period

- No work was completed on site during the month of December.
- During Nathan Jones' inspection on December 30th, the lower end of the grass swale leading to the northern stormwater basin was observed to be too high, causing water to flow along the rip rap toe drain rather than into going down the rip rap down chute into the stormwater basin. Bates corrected the grades in the area outside the reporting period on January 13, 2025.

Construction activity look ahead:

- Erosion controls will remain in place at least through the winter. Erosion and/or sedimentation observed during site inspections were addressed outside of the reporting period on January 13th, 2025 and will continue to be addressed as needed throughout the winter.
- Bates' subcontractor, Geosearch, Inc. of Sterling, MA will complete installation of remaining groundwater and landfill gas monitoring wells.

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- Following the installation of groundwater and gas monitoring wells, the project will be considered substantially complete.

Weather events during the reporting period (greater than one inch precipitation):

- 1.87 inches of precipitation were recorded on December 11th. The Andover Conservation Commission's Environmental Monitor performed a site inspection on December 18th following the rain event and identified several areas of sedimentation and erosion that were addressed by Bates outside of the reporting period on January 13th, 2025.

Items inspected to be in conformance with project approvals:

- There was one inspection completed by the Environmental Monitor during this reporting period on December 18th, 2024. The report noted that a request should be submitted to the Andover Conservation Commission for a temporary pause in inspections once 70% permanent stabilization is achieved and non-compostable erosion site controls have been removed. The report also noted some minor erosion and sedimentation. As noted above, eroded areas were repaired and sedimentation cleaned up outside the reporting period on January 13, 2025. Cleanup of some minor sedimentation in the double-lined wetland basin is still pending and will addressed at a later date.

Deviations from project approvals noted:

There were no deviations from project approvals during this reporting period.

Administrative Consent Order Schedule:

The Town entered into an Administrative Consent Order (ACO) with the MassDEP on November 29, 2022, to complete remaining landfill closure activities at the Ledge Road Landfill. The ACO requires that the landfill cap be substantially complete by June 30, 2025, and submission of a category BWP SW43 "Landfill Closure Completion" for the certification of closure construction by November 1, 2025. It is currently anticipated that the project will be completed in accordance with the ACO schedule.

Photographs documenting the construction progress are attached.

Certification

I, Nathan E. Jones, attest under the pains and penalties of perjury that:

(a) I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification statement;

(b) based on my inquiry of those persons responsible for obtaining the information, the information contained in this submittal is, to the best of my knowledge, true, accurate, and complete;

(c) I am fully authorized to bind the entity required to submit these documents and to make this attestation on behalf of such entity; and

(d) I am aware that there are significant penalties, including, but not limited to, possible administrative and civil penalties for submitting false, inaccurate, or incomplete information and possible fines and imprisonment for knowingly submitting false, inaccurate, or incomplete information.

Please do not hesitate to contact me at (617) 452-6563 if you have any questions or need anything further.

Very truly yours,

Nathan E. Jones, P.E., PMP
Project Manager
CDM Smith Inc.

Attachments
- Photographs

c: Richard Spieler, John Morey, and Karen Stromberg, MassDEP
Carlos Jaquez, Town of Andover
Myles Johnson, CDM Smith

Ledge Road Landfill Closure – Construction Monitoring Report No. 16
Photos

View of the site from Chandler Road – 12/17/2024

View of the site from Chandler Road – 12/17/2024

Grading in grass swale too high and preventing water from reaching northern stormwater basin – 12/30/2024

Water running along rip rap toe drain causing minor erosion – 12/30/2024

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fax: 617 345-3901
cdmsmith.com

February 19, 2025

Mr. Mark Fairbrother
Section Chief, Solid Waste Management
Massachusetts Department of Environmental Protection
Northeast Regional Office
150 Presidential Way
Woburn, Massachusetts 01801

Subject: Construction Monitoring Report No. 17
Ledge Road Landfill Closure
Town of Andover, Massachusetts
BWP SW11 Landfills - Authorization Number SW11AC-0000027

Dear Mr. Fairbrother:

On behalf of the Town of Andover (the Town), CDM Smith Inc. (CDM Smith) has prepared this Construction Monitoring Report No. 17 for the Ledge Road Landfill Closure Project. This report has been prepared to comply with Conditions 5c and 14d of the Massachusetts Department of Environmental Protection (MassDEP) approval dated May 16, 2023. This report covers the period January 1 – January 31, 2025.

Construction monitoring was performed during the month of January while work was being performed on site. Mr. Nathan Jones of CDM Smith performed one periodic inspection during the reporting period on January 29, 2025.

Summary of work completed during the reporting period

- Bates' subcontractor, Geosearch, Inc. of Sterling, MA, completed the installation of landfill gas and groundwater monitoring wells that were not completed in November 2024. A total of 1 groundwater monitoring well and 8 gas monitoring wells were installed during this reporting period. CDM Smith oversaw and monitored drilling operations to ensure wells were installed at desired depths for future sample programs. Newly installed groundwater monitoring wells require development. Following development of groundwater monitoring wells, the project will be considered substantially complete.

- On January 13, 2025, Bates completed grade adjustment within the grass swale along the west slope of the landfill. This work lowered the grade of the lower end of the swale, correcting the issue noted in the previous Construction Monitoring Report No. 16, where water was being diverted to flow along the rip-rap toe drain rather than flowing down the rip-rap down chute into the stormwater basin. Bates also performed cleanup of sediment in areas that breached erosion and sedimentation controls.

WATER + ENVIRONMENT + TRANSPORTATION + ENERGY + FACILITIES

Construction activity look ahead:

- Erosion controls will remain in place at least through the winter. Erosion and/or sedimentation observed during site inspections will continue to be addressed as needed throughout the winter.

Weather events during the reporting period (greater than one inch precipitation):

- There were no days that experienced greater than one inch of precipitation in January 2025.

Items inspected to be in conformance with project approvals:

- There were two inspections completed by the Environmental Monitor during this reporting period.
    - The first inspection occurred on January 2, 2025. The report noted that most disturbed areas have achieved 70% or more coverage and that additional seeding/soil preparation may be required in the spring. The report also noted some minor erosion and sedimentation. As noted above, eroded areas were repaired, and sedimentation cleaned up during this reporting period on January 13, 2025.
    - The second inspection took place on January 15, 2025. The report noted that additional erosion and sedimentation controls require maintenance in reference to the silt fence along the northwestern boundary and the drainage swale along the northeastern boundary.

Deviations from project approvals noted:

There were no deviations from project approvals during this reporting period.

Administrative Consent Order Schedule:

The Town entered into an Administrative Consent Order (ACO) with the MassDEP on November 29, 2022, to complete remaining landfill closure activities at the Ledge Road Landfill. The ACO requires that the landfill cap be substantially complete by June 30, 2025, and submission of a category BWP SW43 “Landfill Closure Completion” for the certification of closure construction by November 1, 2025. It is currently anticipated that the project will be completed in accordance with the ACO schedule.

Photographs documenting the construction progress are attached.

Certification

I, Nathan E. Jones, attest under the pains and penalties of perjury that:

(a) I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification statement;

(b) based on my inquiry of those persons responsible for obtaining the information, the information contained in this submittal is, to the best of my knowledge, true, accurate, and complete;

(c) I am fully authorized to bind the entity required to submit these documents and to make this attestation on behalf of such entity; and

(d) I am aware that there are significant penalties, including, but not limited to, possible administrative and civil penalties for submitting false, inaccurate, or incomplete information and possible fines and imprisonment for knowingly submitting false, inaccurate, or incomplete information.

Please do not hesitate to contact me at (617) 452-6563 if you have any questions or need anything further.

Very truly yours,

Nathan E. Jones, P.E., PMP
Project Manager
CDM Smith Inc.

Attachments
- Photographs

c: Richard Spieler, John Morey, and Karen Stromberg, MassDEP
Carlos Jaquez, Town of Andover
Myles Johnson, CDM Smith

Grade adjustments within grass lined swale of the west slope of the landfill – 01/13/2025

Grade adjustments within grass lined swale of the west slope of the landfill – 01/13/2025

Grade adjustments within grass lined swale of the west slope of the landfill – 01/13/2025

Cleanup of sediment in areas that breached erosion and sedimentation controls – 01/13/2025

Cleanup of sediment in areas that breached erosion and sedimentation controls – 01/13/2025

Cleanup of sediment in areas that breached erosion and sedimentation controls – 01/13/2025

Facing south, monitoring wells installed in early January– 01/22/2025

Facing northwestern section of site, monitoring wells installed in early January– 01/22/2025

Facing southwest at access gate entrance off Greenwood Road – 01/22/2025

Facing northwest at access gate entrance off Greenwood Road – 01/22/2025

Facing north at access gate entrance off Greenwood Road – 01/22/2025

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cdmsmith.com

March 17, 2025

Mr. Mark Fairbrother
Section Chief, Solid Waste Management
Massachusetts Department of Environmental Protection
Northeast Regional Office
150 Presidential Way
Woburn, Massachusetts 01801

Subject: Construction Monitoring Report No. 18
Ledge Road Landfill Closure
Town of Andover, Massachusetts
BWP SW11 Landfills - Authorization Number SW11AC-0000027

Dear Mr. Fairbrother:

On behalf of the Town of Andover (the Town), CDM Smith Inc. (CDM Smith) has prepared this Construction Monitoring Report No. 18 for the Ledge Road Landfill Closure Project. This report has been prepared to comply with Conditions 5c and 14d of the Massachusetts Department of Environmental Protection (MassDEP) approval dated May 16, 2023. This report covers the period February 1 – February 28, 2025.

Construction monitoring was not performed during the month of February as no work was completed on site. Mr. Nathan Jones of CDM Smith performed one periodic inspection during the reporting period on February 28, 2025.

Summary of work completed during the reporting period

- There was no work performed during this reporting period.
- During the inspection on February 28, 2025, some minor erosion was noted that on the east side of the landfill that will need to be addressed in the spring.

Construction activity look ahead:

- Bates' subcontractor, Geosearch, Inc. of Sterling, MA, developed the newly installed groundwater monitoring wells outside the reporting period on March 6 and 7, 2025. With the development of the groundwater monitoring wells, the project is considered substantially complete.
- The minor erosion noted during the inspection on February 28, 2025, will be addressed in the spring.

WATER + ENVIRONMENT + TRANSPORTATION + ENERGY + FACILITIES

- Erosion controls will remain in place until site stabilization. Erosion and/or sedimentation observed during site inspections will continue to be addressed as needed.

Weather events during the reporting period (greater than one inch precipitation):

- There were no weather events that experienced greater than one inch of precipitation in February 2025.

Items inspected to be in conformance with project approvals:

- There was one inspection completed by the Environmental Monitor during this reporting period on February 12, 2025. No significant issues were observed on site. With the lack of consequential issues and the snow-covered conditions, a report was not generated for this inspection. The northwest erosion and sediment controls discussed in the previous progress report were noted to be stable, but the environmental monitor noted that a few areas that may require maintenance when the ground thaws. Site visits by the environmental monitor are currently limited to when temperatures, significant precipitation, or snowmelt events warrant an inspection. The Environmental Monitor will continue to monitor weather conditions and visit the site on an as needed basis until revegetation monitoring resumes in the spring.

Deviations from project approvals noted:

There were no deviations from project approvals during this reporting period.

Administrative Consent Order Schedule:

The Town entered into an Administrative Consent Order (ACO) with the MassDEP on November 29, 2022, to complete remaining landfill closure activities at the Ledge Road Landfill. The ACO requires that the landfill cap be substantially complete by June 30, 2025, and submission of a category BWP SW43 “Landfill Closure Completion” for the certification of closure construction by November 1, 2025. It is currently anticipated that the project will be completed in accordance with the ACO schedule.

Photographs documenting the construction progress are attached.

Certification

I, Nathan E. Jones, attest under the pains and penalties of perjury that:

(a) I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification statement;

(b) based on my inquiry of those persons responsible for obtaining the information, the information contained in this submittal is, to the best of my knowledge, true, accurate, and complete;

(c) I am fully authorized to bind the entity required to submit these documents and to make this attestation on behalf of such entity; and

(d) I am aware that there are significant penalties, including, but not limited to, possible administrative and civil penalties for submitting false, inaccurate, or incomplete information and possible fines and imprisonment for knowingly submitting false, inaccurate, or incomplete information.

Please do not hesitate to contact me at (617) 452-6563 if you have any questions or need anything further.

Very truly yours,

Nathan E. Jones, P.E., PMP
Project Manager
CDM Smith Inc.

Attachments
- Photographs

c: Richard Spieler, John Morey, and Karen Stromberg, MassDEP
Carlos Jaquez, Town of Andover
Myles Johnson, CDM Smith

Greenwood Road drainage outfall and swale – 02/28/2025

Southern stormwater basin – 02/28/2025

Access Road and drainage swale, facing Greenwood Road – 02/28/2025

Double-lined wetland basin and swale– 02/28/2025

Facing northwest from Greenwood Road – 02/28/2025

Landfill gas well and double-lined wetland basin – 02/28/2025

Facing north from Greenwood Road – 02/28/2025

Facing north from along Greenwood Road – 02/28/2025

Facing north from along former Ledge Road – 02/28/2025

Minor erosion along northeast toe of landfill slope – 02/28/2025

Minor erosion along northeast toe of landfill slope – 02/28/2025

Minor erosion along northeast toe of landfill slope – 02/28/2025

Minor erosion along northeast toe of landfill slope – 02/28/2025

Facing south along former Ledge Road – 02/28/2025

Facing south along former Ledge Road – 02/28/2025

Facing northwest toward Chandler Road – 02/28/2025

Facing eastern section of site, wooded area – 02/28/2025

New Chandler Road guard rail – 02/28/2025

New site access gate on Chandler Road – 02/28/2025

Facing east from site gate along Chandler Road – 02/28/2025

Facing south from Chandler Road – 02/28/2025

Northern stormwater basin – 02/28/2025

Northwestern side slope– 02/28/2025

Northern stormwater basin and outlet control structure – 02/28/2025

Wetland soil removal area 1 – 02/28/2025

Access road along western edge of site – 02/28/2025

Wetland removal area 3 – 02/28/2025

Western side slopes – 02/28/2025

Southern stormwater basin – 02/28/2025

Access road around southern stormwater basin – 02/28/2025

Wetland replication area – 02/28/2025

Wetland soil removal area 7 – 02/28/2025

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cdmsmith.com

April 15, 2025

Mr. Mark Fairbrother
Section Chief, Solid Waste Management
Massachusetts Department of Environmental Protection
Northeast Regional Office
150 Presidential Way
Woburn, Massachusetts 01801

Subject: Construction Monitoring Report No. 19
Ledge Road Landfill Closure
Town of Andover, Massachusetts
BWP SW11 Landfills - Authorization Number SW11AC-0000027

Dear Mr. Fairbrother:

On behalf of the Town of Andover (the Town), CDM Smith Inc. (CDM Smith) has prepared this Construction Monitoring Report No. 19 for the Ledge Road Landfill Closure Project. This report has been prepared to comply with Conditions 5c and 14d of the Massachusetts Department of Environmental Protection (MassDEP) approval dated May 16, 2023. This report covers the period March 1 – March 31, 2025.

Full time construction monitoring was not performed during the month of March as no construction work was completed on site; however, a representative from CDM Smith performed oversight during monitoring well development on March 6 and 7, 2025. Mr. Nathan Jones of CDM Smith performed one periodic inspection during the reporting period on March 31, 2025.

Summary of work completed during the reporting period

- During this reporting period, Bates' subcontractor, Geosearch, Inc. of Sterling, MA, developed the newly installed groundwater monitoring wells on March 6 and 7, 2025. With the development of the groundwater monitoring wells, the project is considered substantially complete.

- During the inspections by the Environmental Monitor and Mr. Nathan Jones on March 5, 19, and 31, some minor erosion and sediment accumulation was noted in the northeast and northwest sides of the landfill that will need to be addressed in the spring.

Construction activity look ahead:

- The minor erosion noted during the inspections in March 2025, will be addressed in the spring.

- Erosion controls will remain in place until site stabilization. Erosion and/or sedimentation observed during site inspections will continue to be addressed as needed.

Weather events during the reporting period (greater than one inch precipitation):

- There were no days with greater than one inch of precipitation during the month of March. There were two two-day (March 6-7, 2025, and March 17-18, 2025) periods with intermittent rain that totaled 1.03 inches and 1.26 inches, respectively. An erosion and sediment control inspection was performed on March 19, 2025, following the second two-day period with precipitation greater than one inch.

Items inspected to be in conformance with project approvals:

- Two erosion site control inspections were completed by the Environmental Monitor during this reporting period on March 5th and March 19th, both of which noted that erosion and sediment controls should continue to be monitored until disturbed areas are fully stabilized. Erosion and sediment controls require maintenance along the northwest limit of work boundary of the site. Actions should also be taken to remove sediments from the drainage swale in the northeast limit of work boundary, and then this swale should be stabilized. During the March 19th inspection it was also noted that areas of localized erosion in unstabilized areas will need to be repaired and resulting sediment should be removed. The Environmental Monitor also recommended that erosion and sediment controls be implemented along the roadway next to unstabilized areas along Greenwood Road. The Environmental Monitor will continue to monitor weather conditions and visit the site on an as needed basis until revegetation monitoring resumes in the spring.

Deviations from project approvals noted:

There were no deviations from project approvals during this reporting period.

Administrative Consent Order Schedule:

The Town entered into an Administrative Consent Order (ACO) with the MassDEP on November 29, 2022, to complete remaining landfill closure activities at the Ledge Road Landfill. The ACO requires that the landfill cap be substantially complete by June 30, 2025, and submission of a category BWP SW43 “Landfill Closure Completion” for the certification of closure construction by November 1, 2025. It is currently anticipated that the project will be completed in accordance with the ACO schedule.

Photographs documenting the construction progress are attached.

Certification

I, Nathan E. Jones, attest under the pains and penalties of perjury that:

(a) I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification statement;

(b) based on my inquiry of those persons responsible for obtaining the information, the information contained in this submittal is, to the best of my knowledge, true, accurate, and complete;

(c) I am fully authorized to bind the entity required to submit these documents and to make this attestation on behalf of such entity; and

(d) I am aware that there are significant penalties, including, but not limited to, possible administrative and civil penalties for submitting false, inaccurate, or incomplete information and possible fines and imprisonment for knowingly submitting false, inaccurate, or incomplete information.

Please do not hesitate to contact me at (617) 452-6563 if you have any questions or need anything further.

Very truly yours,

Nathan E. Jones, P.E., PMP
Project Manager
CDM Smith Inc.

Attachments
- Photographs

c: Richard Spieler, John Morey, and Karen Stromberg, MassDEP
Carlos Jaquez, Town of Andover
Myles Johnson, CDM Smith

Ledge Road Landfill Closure – Construction Monitoring Report No. 19
Photos

Landfill gas well and double-lined wetland basin – 03/31/2025

Double-lined wetland basin spillway adjacent to Greenwood Road – 03/31/2025

Access Road and drainage swale, view from Greenwood Road – 03/31/2025

Unstabilized area with minor erosion and monitoring wells east of landfill (former Ledge Road) – 03/31/2025

Unstabilized area with minor erosion and monitoring wells east of landfill (former Ledger Road) – 03/31/2025

Sediment deposits from above erosion in double-lined wetland basin – 03/31/2025

Western side slope, monitoring wells, and wetland area. Erosion controls require minor maintenance – 03/31/2025

Western side slope and vernal pool area. Erosion controls require minor maintenance – 03/31/2025

Western side slope and wetland area.– 03/31/2025

Western side slope and wetland area.– 03/31/2025

Western side slope and wetland excavation area. Erosion controls requiring maintenance – 03/31/2025

Western side slope, monitoring wells, and wetland area – 03/31/2025

Northern stormwater basin and outlet control structure – 03/31/2025

Erosion and sediment controls facing northeast to Chandler Road – 03/31/2025

Erosion and sediment controls facing northeast to Chandler Road – 03/31/2025

Southern stormwater basin – 03/31/2025

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May 14, 2025

Mr. Mark Fairbrother
Section Chief, Solid Waste Management
Massachusetts Department of Environmental Protection
Northeast Regional Office
150 Presidential Way
Woburn, Massachusetts 01801

Subject: Construction Monitoring Report No. 20
Ledge Road Landfill Closure
Town of Andover, Massachusetts
BWP SW11 Landfills - Authorization Number SW11AC-0000027

Dear Mr. Fairbrother:

On behalf of the Town of Andover (the Town), CDM Smith Inc. (CDM Smith) has prepared this Construction Monitoring Report No. 20 for the Ledge Road Landfill Closure Project. This report has been prepared to comply with Conditions 5c and 14d of the Massachusetts Department of Environmental Protection (MassDEP) approval dated May 16, 2023. This report covers the period April 1 – April 30, 2025.

Full time construction monitoring was not performed during the month of April as no construction work was completed on site. Mr. Nathan Jones of CDM Smith performed two periodic inspections during the reporting period on April 22 and April 28, 2025.

Summary of work completed during the reporting period

- During the inspections by the Environmental Monitor and Mr. Nathan Jones on April 2, 16, 22, and 28, some minor erosion and sediment accumulation were noted in the southeast, northeast, and northwest sides of the landfill that will need to be addressed this spring.

Construction activity look ahead:

- The minor erosion noted during the inspections in April 2025 will be addressed this spring.
- Erosion controls will remain in place until site stabilization. Erosion and/or sedimentation observed during site inspections will continue to be addressed as needed.

Weather events during the reporting period (greater than one inch precipitation):

- There were no days with greater than one inch of precipitation during the month of April.

WATER + ENVIRONMENT + TRANSPORTATION + ENERGY + FACILITIES

Items inspected to be in conformance with project approvals:

- Two erosion site control inspections were completed by the Environmental Monitor during this reporting period on April 2nd and April 16th, both of which noted that erosion and sediment controls should continue to be monitored until disturbed areas are fully stabilized. Erosion and sediment controls require maintenance along the northwest limit of work boundary of the site. Erosion in the northeast portion of the site outside the riprap toe drain along the former Ledge Road requires repair and resulting sedimentation from double lined wetland basin needs to be removed. The gullies within the northwest basin should be repaired and resultant sediment deposits should be removed. The Environmental Monitor also recommended that erosion and sediment controls be implemented for the catch basins along Greenwood Road. As the site is currently not manned, monitoring and maintenance of erosion controls would not be feasible. The catch basins in Greenwood Road are new deep sump catch basins, which will be cleaned out as necessary. There is also a new particle separator downstream of the catch basin to remove any suspended solids. The Environmental Monitor will continue to monitor weather conditions and visit the site on an as needed basis until revegetation monitoring resumes in the spring.

Deviations from project approvals noted:

There were no deviations from project approvals during this reporting period.

Administrative Consent Order Schedule:

The Town entered into an Administrative Consent Order (ACO) with the MassDEP on November 29, 2022, to complete remaining landfill closure activities at the Ledge Road Landfill. The ACO requires that the landfill cap be substantially complete by June 30, 2025, and submission of a category BWP SW43 "Landfill Closure Completion" for the certification of closure construction by November 1, 2025. Following the development of the installed monitoring wells in March 2025, the project is considered substantially complete. It is currently anticipated that the project will be completed in accordance with the ACO schedule.

Photographs documenting the construction progress are attached.

Certification

I, Nathan E. Jones, attest under the pains and penalties of perjury that:

(a) I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification statement;

(b) based on my inquiry of those persons responsible for obtaining the information, the information contained in this submittal is, to the best of my knowledge, true, accurate, and complete;

(c) I am fully authorized to bind the entity required to submit these documents and to make this attestation on behalf of such entity; and

(d) I am aware that there are significant penalties, including, but not limited to, possible administrative and civil penalties for submitting false, inaccurate, or incomplete information and possible fines and imprisonment for knowingly submitting false, inaccurate, or incomplete information.

Please do not hesitate to contact me at (617) 452-6563 if you have any questions or need anything further.

Very truly yours,

Nathan E. Jones, P.E., PMP
Project Manager
CDM Smith Inc.

Attachments
- Photographs

c: Richard Spieler, John Morey, and Karen Stromberg, MassDEP
Carlos Jaquez, Town of Andover
Myles Johnson, CDM Smith

Ledge Road Landfill Closure – Construction Monitoring Report No. 20
Photos

Northern stormwater basin and outlet control structure – 04/22/2025

Erosion and sediment controls at northwest section of site – 04/22/2025

Minor erosion in northern stormwater basin – 04/22/2025

Groundwater and gas monitoring wells, gas vents, and installed guardrail along Chandler Road – 04/22/2025

View of landfill facing south from Chandler Road – 04/22/2025

Erosion and sediment controls, gas vents, and rip rap swale facing southwest from Chandler Road – 04/22/2025

Landfill gas well and double-lined wetland basin and basin spillway – 04/22/2025

Gas wells and double-lined wetland basin along Greenwood Street – 04/22/2025

Gas well, double-lined wetland basin spillway, and drainage swale near Greenwood Street entrance gate – 04/22/2025

Wetland Excavation Area 7 – 04/22/2025

Southern stormwater basin and outlet control structure – 04/22/2025

Wetland replication area behind trees and berm – 04/22/2025

Erosion and sediment controls along western section of site – 04/22/2025

Unstabilized area with erosion along the eastern edge of landfill – 04/22/2025

Erosion along toe drain at the eastern edge of the landfill– 04/22/2025

Facing Chandler Road, installed guardrail and boulders surrounding wooded area – 04/22/2025

View of landfill facing south towards Greenwood Road – 04/22/2025

Northwest slope of landfill above northern stormwater basin with minor erosion – 04/28/2025

Southern stormwater basin and outlet control structure – 04/28/2025

Southern stormwater basin – 04/28/2025

New Greenwood Road stormwater outfall and groundwater monitoring wells – 04/28/2025

Wetland replication area behind trees and berm – 04/28/2025

Access road along western section of site and western slope of landfill – 04/28/2025

Erosion and sediment control barriers on western section of site north of access road – 04/28/2025

Erosion and sediment controls along Wetland Excavation Area 2 – 04/28/2025

Erosion and sediment controls along northwestern limit of work – 04/28/2025

Northern stormwater basin and outlet control structure – 04/28/2025

Erosion and sediment control barriers along western section of site and western slope of landfill – 04/28/2025

Northern stormwater basin and outlet control structure – 04/28/2025

Northwestern slope of landfill with erosion above and in northern stormwater basin – 04/28/2025

Northern stormwater basin and outlet control structure – 04/28/2025

Gas monitoring wells and gas vents in distance facing Chandler Road – 04/28/2025

View of landfill facing north towards Chandler Road – 04/28/2025

Gas well, double lined wetland basin, and basin spill way near entrance gate on Greenwood Road – 04/28/2025

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cdmsmith.com

June 27, 2025

Mr. Mark Fairbrother
Section Chief, Solid Waste Management
Massachusetts Department of Environmental Protection
Northeast Regional Office
150 Presidential Way
Woburn, Massachusetts 01801

Subject: Construction Monitoring Report No. 21
Ledge Road Landfill Closure
Town of Andover, Massachusetts
BWP SW11 Landfills - Authorization Number SW11AC-0000027

Dear Mr. Fairbrother:

On behalf of the Town of Andover (the Town), CDM Smith Inc. (CDM Smith) has prepared this Construction Monitoring Report No. 21 for the Ledge Road Landfill Closure Project. This report has been prepared to comply with Conditions 5c and 14d of the Massachusetts Department of Environmental Protection (MassDEP) approval dated May 16, 2023. This report covers the period May 1 – May 31, 2025.

Full-time construction monitoring was not performed during the month of May as no major construction work was completed on site. Mr. Myles Johnson of CDM Smith performed one site visit on May 14, 2025, on behalf of the Engineer of Record, Mr. Nathan Jones.

Summary of work completed during the reporting period

- Minor repair work was completed in some areas where erosion was previously noted.

Construction activity look ahead:

- Erosion controls will remain in place until site stabilization. Erosion and/or sedimentation observed during site inspections will continue to be addressed as needed.

- The southern gas vent trench will be extended around the eastern stormwater basin toward the landfill gas well LFG-10 area. This is being completed to address landfill gas hits observed in LFG-9 during the December and March landfill gas monitoring events. The proposed change was emailed to MassDEP on May 21, 2025, and approved via email on May 22, 2025.

Weather events during the reporting period (greater than one inch precipitation):

- 1.00 inches of rain were recorded on May 9th.

WATER + ENVIRONMENT + TRANSPORTATION + ENERGY + FACILITIES

- 1.57 inches of rain were recorded on May 22nd.

Items inspected to be in conformance with project approvals:

- Three erosion and sediment control inspections were conducted on May 2nd, 14th, and 28th. ESCs along the northwest limit of work (LOW) require maintenance. Minor erosion in the northwest and southeast basins were repaired by the final inspection, and sediment deposits in the southeast basin were removed. Vegetation coverage remains below target in several areas, especially near Chandler Road and former access roads. The wetland replication area still falls short of the 75% coverage required, particularly in the ponded area. The inspections noted most live stakes in wetland removal area 6 have failed; however, replacement was completed in early June. Sediment continues to accumulate around catch basins on Greenwood Road. Catch basins are new deep sump catch basins and will be cleaned out as necessary. There is also a new particle separator downstream of the catch basin to remove any suspended solids.

Deviations from project approvals noted:

There were no deviations from project approvals during this reporting period.

Administrative Consent Order Schedule:

The Town entered into an Administrative Consent Order (ACO) with the MassDEP on November 29, 2022, to complete remaining landfill closure activities at the Ledge Road Landfill. The ACO requires that the landfill cap be substantially complete by June 30, 2025, and submission of a category BWP SW43 "Landfill Closure Completion" for the certification of closure construction by November 1, 2025. Following the development of the installed monitoring wells in March 2025, the project is considered substantially complete. It is currently anticipated that the project will be completed in accordance with the ACO schedule.

Photographs documenting the construction progress are attached.

Certification

I, Nathan E. Jones, attest under the pains and penalties of perjury that:

(a) I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification statement;

(b) based on my inquiry of those persons responsible for obtaining the information, the information contained in this submittal is, to the best of my knowledge, true, accurate, and complete;

(c) I am fully authorized to bind the entity required to submit these documents and to make this attestation on behalf of such entity; and

(d) I am aware that there are significant penalties, including, but not limited to, possible administrative and civil penalties for submitting false, inaccurate, or incomplete information and

possible fines and imprisonment for knowingly submitting false, inaccurate, or incomplete information.

Please do not hesitate to contact me at (617) 452-6563 if you have any questions or need anything further.

Very truly yours,

Nathan E. Jones, P.E., PMP
Project Manager
CDM Smith Inc.

Attachments
- Photographs

c: Richard Spieler, John Morey, and Karen Stromberg, MassDEP
Carlos Jaquez, Town of Andover
Myles Johnson, CDM Smith

Ledge Road Landfill Closure – Construction Monitoring Report No. 21
Photos

Double-lined wetland basin, landfill gas vent, and wells

Former Ledge Road site entrance with newly planted trees and landfill gas monitoring well

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fax: 617 345-3901
cdmsmith.com

July 22, 2025

Mr. Mark Fairbrother
Section Chief, Solid Waste Management
Massachusetts Department of Environmental Protection
Northeast Regional Office
150 Presidential Way
Woburn, Massachusetts 01801

Subject: Construction Monitoring Report No. 22
Ledge Road Landfill Closure
Town of Andover, Massachusetts
BWP SW11 Landfills - Authorization Number SW11AC-0000027

Dear Mr. Fairbrother:

On behalf of the Town of Andover (the Town), CDM Smith Inc. (CDM Smith) has prepared this Construction Monitoring Report No. 22 for the Ledge Road Landfill Closure Project. This report has been prepared to comply with Conditions 5c and 14d of the Massachusetts Department of Environmental Protection (MassDEP) approval dated May 16, 2023. This report covers the period June 1 – June 30, 2025.

Full-time construction monitoring was performed by CDM Smith when construction activities were being completed. Mr. Nathan Jones of CDM Smith performed one site visit during the reporting period on June 16, 2025.

Summary of work completed during the reporting period

- On June 3 – June 5, 2025, live stakes were replaced in Wetland Removal Areas 4 and 6 as the previous live stakes were dormant for an extended period. During the Erosion Site Control (ESC) inspection on June 12th and June 18th, the newly installed silky willow plugs were observed to be doing well. Photos from the June 18th inspection are included in the photo log.

- From June 11 - June 17, 2025, the construction contractor J. Bates & Son LLC, with oversight provided by CDM Smith, extended the southern gas vent trench around the eastern stormwater basin toward the landfill gas well LFG-10 area. This was completed to address landfill gas hits observed in LFG-9 during the December and March landfill gas monitoring events. The proposed change was emailed to MassDEP on May 21, 2025, and approved via email on May 22, 2025.

WATER + ENVIRONMENT + TRANSPORTATION + ENERGY + FACILITIES

Construction activity look ahead:

- Erosion controls will remain in place until site stabilization. Erosion and/or sedimentation observed during site inspections will continue to be addressed as needed.

Weather events during the reporting period (greater than one inch precipitation):

- There were no days with an inch or more precipitation in June 2025.

Items inspected to be in conformance with project approvals:

- Two erosion and sediment control inspections were conducted on June 12th and 18th. Erosion controls along the northwest limit of work require maintenance. Vegetation coverage remains below target in several areas, especially along the former Ledge Road where vehicles accessed for construction of the gas vent trench. The wetland replication area still falls short of the 75% coverage required, particularly in the ponded area. The inspections noted that plugs in wetland removal areas 4 and 6 replaced June 3-5 appear to be doing well. Sediment continues to accumulate around catch basins on Greenwood Road. Catch basins are new deep sump catch basins and will be cleaned out as necessary. There is also a new particle separator downstream of the catch basin to remove any suspended solids. Additional soil preparation and seeding of the re-disturbed area may be necessary due to the gas vent trench extension along the eastern site boundary between Chandler Road and Greenwood Road along with the restoration of the southeast stormwater basin.

Deviations from project approvals noted:

There were no deviations from project approvals during this reporting period.

Administrative Consent Order Schedule:

The Town entered into an Administrative Consent Order (ACO) with the MassDEP on November 29, 2022, to complete remaining landfill closure activities at the Ledge Road Landfill. The ACO requires that the landfill cap be substantially complete by June 30, 2025, and submission of a category BWP SW43 "Landfill Closure Completion" for the certification of closure construction by November 1, 2025. Following the development of the installed monitoring wells in March 2025, the project is considered substantially complete. It is currently anticipated that the project will be completed in accordance with the ACO schedule.

Photographs documenting the construction progress are attached.

Certification

I, Nathan E. Jones, attest under the pains and penalties of perjury that:

(a) I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification statement;

(b) based on my inquiry of those persons responsible for obtaining the information, the information contained in this submittal is, to the best of my knowledge, true, accurate, and complete;

(c) I am fully authorized to bind the entity required to submit these documents and to make this attestation on behalf of such entity; and

(d) I am aware that there are significant penalties, including, but not limited to, possible administrative and civil penalties for submitting false, inaccurate, or incomplete information and possible fines and imprisonment for knowingly submitting false, inaccurate, or incomplete information.

Please do not hesitate to contact me at (617) 452-6563 if you have any questions or need anything further.

Very truly yours,

Nathan E. Jones, P.E., PMP
Project Manager
CDM Smith Inc.

Attachments
- Photographs

c: Richard Spieler, John Morey, and Karen Stromberg, MassDEP
Carlos Jaquez, Town of Andover
Myles Johnson, CDM Smith

Live stake replacement work in Wetland Removal Area 6 – 06/03/2025

Silky Willow plugs staged for installation to replace live stakes – 06/03/2025

Live stake replacement work in Wetland Removal Area 6 – 06/03/2025

Live stake replacement work in Wetland Removal Area 6 – 06/04/2025

Live stake replacement work in Wetland Removal Area 6 – 06/04/2025

Installed silky willow plugs in Wetland Removal Area 6 – 06/04/2025

Installed silky willow plugs in Wetland Removal Area 6 – 06/04/2025

Wetland Removal Area 4 following live stake replacement – 06/05/2025

J. Bates & Son LLC laying out southern gas vent trench extension – 06/11/2025

Southern gas vent trench extension construction– 06/11/2025

Southern gas vent trench extension construction – 06/11/2025

Perforated pipe installed in gas vent trench extension – 06/11/2025

Southern gas vent trench extension construction– 06/11/2025

Placement of liner in southern gas vent trench extension– 06/11/2025

Southern gas vent trench extension construction – 06/12/2025

Southern gas vent trench extension construction – 06/12/2025

Southern gas vent trench extension construction– 06/12/2025

Southern gas vent trench extension construction – 06/12/2025

Damage to edge of pavement on Greenwood Road following gas vent trench extension – 06/12/2025

Southern gas vent trench extension construction – 06/16/2025

Southern gas vent trench extension construction – 06/16/2025

Test pit completed by LFG-9, no waste material observed – 06/16/2025

Test pit completed by LFG-9, no waste material observed– 06/16/2025

Southern gas vent trench extension construction– 06/16/2025

Repairs to washout outside of northern stormwater basin berm performed during previous reporting period – 6/16/2025

Repairs to washouts on inside slope of northern stormwater basin and slope above northern stormwater basin performed during previous reporting period – 6/16/2025

Welding of liner flap for the gas vent trench extension – 06/17/2025

Testing of liner flap weld – 06/17/2025

Testing of liner flap weld – 06/17/2025

Southern gas vent trench extension before backfilling and regrading – 06/17/2025

Southern gas vent trench extension following backfilling grading and seeding – 06/17/2025

Photo from Erosion Site Control inspection report taken June 18th noting that live stake replacements in Weltand Excavation Area 6 are doing well.

Photo from Erosion Site Control inspection report taken June 18th noting that live stake replacements in Weltand Excavation Area 4 are doing well.

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cdmsmith.com

September 2, 2025

Mr. Mark Fairbrother
Section Chief, Solid Waste Management
Massachusetts Department of Environmental Protection
Northeast Regional Office
150 Presidential Way
Woburn, Massachusetts 01801

Subject: Construction Monitoring Report No. 23
Ledge Road Landfill Closure
Town of Andover, Massachusetts
BWP SW11 Landfills - Authorization Number SW11AC-0000027

Dear Mr. Fairbrother:

On behalf of the Town of Andover (the Town), CDM Smith Inc. (CDM Smith) has prepared this Construction Monitoring Report No. 23 for the Ledge Road Landfill Closure Project. This report has been prepared to comply with Conditions 5c and 14d of the Massachusetts Department of Environmental Protection (MassDEP) approval dated May 16, 2023. This report covers the period July 1 – July 31, 2025.

Full-time construction monitoring was not performed during July as no construction activities were completed. Mr. Myles Johnson of CDM Smith performed two site visits during the reporting period on July 5 and 31, 2025.

Summary of work completed during the reporting period

- No work was completed on site during the month of July.

Construction activity look ahead:

- Erosion controls will remain in place until site stabilization. Erosion and/or sedimentation observed during site inspections will continue to be addressed as needed.

Weather events during the reporting period (greater than one inch precipitation):

- 1.62 inches of rain were from a storm that occurred on July 31st.

Items inspected to be in conformance with project approvals:

- Two erosion and sediment control inspections were conducted on July 10th and 28th. Erosion controls along the northwest limit of work require maintenance. Vegetation coverage remains

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below target in some areas, although the growth in the recently disturbed area along Greenwood Road has progressed significantly. The wetland replication area still falls short of the 75% coverage required, particularly in the ponded area. Sediment continues to accumulate around catch basins on Greenwood Road. Catch basins are new deep sump catch basins and will be cleaned out as necessary. There is also a new particle separator downstream of the catch basin to remove any suspended solids.

Deviations from project approvals noted:

There were no deviations from project approvals during this reporting period.

Administrative Consent Order Schedule:

The Town entered into an Administrative Consent Order (ACO) with the MassDEP on November 29, 2022, to complete remaining landfill closure activities at the Ledge Road Landfill. The ACO requires that the landfill cap be substantially complete by June 30, 2025, and submission of a category BWP SW43 "Landfill Closure Completion" for the certification of closure construction by November 1, 2025. Following the development of the installed monitoring wells in March 2025, the project is considered substantially complete. It is currently anticipated that the project will be completed in accordance with the ACO schedule.

Photographs documenting the construction progress are attached.

Certification

I, Nathan E. Jones, attest under the pains and penalties of perjury that:

(a) I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification statement;

(b) based on my inquiry of those persons responsible for obtaining the information, the information contained in this submittal is, to the best of my knowledge, true, accurate, and complete;

(c) I am fully authorized to bind the entity required to submit these documents and to make this attestation on behalf of such entity; and

(d) I am aware that there are significant penalties, including, but not limited to, possible administrative and civil penalties for submitting false, inaccurate, or incomplete information and possible fines and imprisonment for knowingly submitting false, inaccurate, or incomplete information.

Please do not hesitate to contact me at (617) 452-6563 if you have any questions or need anything further.

Very truly yours,

Nathan E. Jones, P.E., PMP
Project Manager
CDM Smith Inc.

Attachments
- Photographs

c: Richard Spieler, John Morey, and Karen Stromberg, MassDEP
Carlos Jaquez, Town of Andover
Myles Johnson, CDM Smith

Ledge Road Landfill Closure – Construction Monitoring Report No. 23
Photos

Newly installed gas vent trench - 7/5/25

Double-lined wetland basin - 7/5/25

Former Ledge Road entrance restored following gas vent trench installation – 7/5/25

View of landfill from former Ledge Road – 7/5/25

Eastern slope of landfill - 7/5/25

Trees planted within the limits of the former Ledge Road – 7/31/25

Double-lined wetland basin and newly installed gas vent trench – 7/31/25

Repaired area along eastern side of landfill – 7/31/25

Repaired area bewteen Chandler Road and eastern side of landfill – 7/31/25

Eastern slope of landfill – 7/31/25

Eastern slope of landfill – 7/31/25

Western slope of landfill – 7/31/25

View of the landfill from the Chandler Road site entrance – 7/31/25

View of the landfill from the Chandler Road site entrance – 7/31/25

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October 24, 2025

Mr. Mark Fairbrother
Section Chief, Solid Waste Management
Massachusetts Department of Environmental Protection
Northeast Regional Office
150 Presidential Way
Woburn, Massachusetts 01801

Subject: Construction Monitoring Report No. 24
Ledge Road Landfill Closure
Town of Andover, Massachusetts
BWP SW11 Landfills - Authorization Number SW11AC-0000027

Dear Mr. Fairbrother:

On behalf of the Town of Andover (the Town), CDM Smith Inc. (CDM Smith) has prepared this Construction Monitoring Report No. 24 for the Ledge Road Landfill Closure Project. This report has been prepared to comply with Conditions 5c and 14d of the Massachusetts Department of Environmental Protection (MassDEP) approval dated May 16, 2023. This report covers the period August 1 – August 31, 2025.

Full-time construction monitoring was not performed during July as no construction activities were completed. Mr. Nathan Jones of CDM Smith performed one site visit during the reporting period on August, 18 2025.

Summary of work completed during the reporting period

- Bates reseeded and fertilized the bare areas that remain along the former Ledge Road between Greenwood Road and Chandler Road.

Construction activity look ahead:

- Erosion controls will remain in place until site stabilization. Erosion and/or sedimentation observed during site inspections will continue to be addressed as needed.

Weather events during the reporting period (greater than one inch precipitation):

- 1.48 inches of rain were from a storm that occurred on August 13th.

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Items inspected to be in conformance with project approvals:

- Two erosion and sediment control inspections were conducted on August 14th and August 27th. Vegetation coverage remains below target in some areas, although the growth in the recently disturbed area along Greenwood Road has progressed significantly. The wetland replication area still falls short of the 75% coverage required, particularly in the ponded area.

Deviations from project approvals noted:

There were no deviations from project approvals during this reporting period.

Administrative Consent Order Schedule:

The Town entered into an Administrative Consent Order (ACO) with the MassDEP on November 29, 2022, to complete remaining landfill closure activities at the Ledge Road Landfill. The ACO requires that the landfill cap be substantially complete by June 30, 2025, and submission of a category BWP SW43 "Landfill Closure Completion" for the certification of closure construction by November 1, 2025. Following the development of the installed monitoring wells in March 2025, the project is considered substantially complete. It is currently anticipated that the project will be completed in accordance with the ACO schedule.

Photographs documenting the construction progress are attached.

Certification

I, Nathan E. Jones, attest under the pains and penalties of perjury that:

(a) I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification statement;

(b) based on my inquiry of those persons responsible for obtaining the information, the information contained in this submittal is, to the best of my knowledge, true, accurate, and complete;

(c) I am fully authorized to bind the entity required to submit these documents and to make this attestation on behalf of such entity; and

(d) I am aware that there are significant penalties, including, but not limited to, possible administrative and civil penalties for submitting false, inaccurate, or incomplete information and possible fines and imprisonment for knowingly submitting false, inaccurate, or incomplete information.

Please do not hesitate to contact me at (617) 452-6563 if you have any questions or need anything further.

Very truly yours,

Nathan E. Jones, P.E., PMP
Project Manager
CDM Smith Inc.

Attachments
- Photographs

c: Richard Spieler, John Morey, and Karen Stromberg, MassDEP
Carlos Jaquez, Town of Andover
Myles Johnson, CDM Smith

Double-lined wetland basin spillway

Double-lined wetland basin

Gas vents for passive vent trench extension along Greenwood Road

Location of completed gas vent trench extension at former Ledge Road site entrance

Double-lined wetland basin

Former Ledge Road entrance from Greenwood Road

Double-lined basin

Rip rap swale downgradient of double-lined basin

Southern double-lined detention basin

Access drive looking toward Greenwood Road

Southern double-lined basin

Outfall for Greenwood Road drainage

Wetland replication area

Wetland replication area

Wetland replication area

Wetland replication area

Wetland replication area

Wetland replication area

Wetland replication area

Wetland replication area

Wetland excavation area 5

Wetland replication area

Wetland replication area

Southwestern side slopes

Southwestern side slope and toe drain

Wetland Excavation Area 2

Access drive turn around

Northern stormwater detention basin

Washout repairs on western side slope

Northern detention basin spillway

Western side slope

Northern stormwater basin

Landfill plateau

Landfill gas vents and landfill plateau

Landfill plateau

Former Ledge Road along eastern edge of the landfill

Former Ledge Road along eastern edge of the landfill

Former Ledge Road along eastern edge of the landfill

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cdmsmith.com

October 24, 2025

Mr. Mark Fairbrother
Section Chief, Solid Waste Management
Massachusetts Department of Environmental Protection
Northeast Regional Office
150 Presidential Way
Woburn, Massachusetts 01801

Subject: Construction Monitoring Report No. 25
Ledge Road Landfill Closure
Town of Andover, Massachusetts
BWP SW11 Landfills - Authorization Number SW11AC-0000027

Dear Mr. Fairbrother:

On behalf of the Town of Andover (the Town), CDM Smith Inc. (CDM Smith) has prepared this Construction Monitoring Report No. 25 for the Ledge Road Landfill Closure Project. This report has been prepared to comply with Conditions 5c and 14d of the Massachusetts Department of Environmental Protection (MassDEP) approval dated May 16, 2023. This report covers the period September 1 – September 30, 2025.

Full-time construction monitoring was not performed during September as no construction activities were completed. Mr. Chandler Petterson of CDM Smith on behalf of Mr. Nathan Jones (Project Manager) performed one site visit during the reporting period on September 26, 2025.

Summary of work completed during the reporting period

- No work was completed during this reporting period.

Construction activity look ahead:

- Erosion controls will remain in place until site stabilization. Erosion and/or sedimentation observed during site inspections will continue to be addressed as needed.

Weather events during the reporting period (greater than one inch precipitation):

- There was one 2-day weather event totaling greater than one inch of precipitation where 0.50 inches and 0.52 inches of rain fell on September 7th and September 8th , respectively.

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Items inspected to be in conformance with project approvals:

- Washout repairs on west slope above northern detention basin in good condition with vegetation fully established. Due to drought conditions, vegetation has not been reestablished in area of former Ledge Road where washouts were repaired in the spring. This area is outside of the cap. Bates will install additional topsoil and reseed.

- Two erosion and sediment control inspections were conducted on September 10th and September 24th. Vegetation coverage remains below target in some areas, although the growth in the recently disturbed area along Greenwood Road has progressed significantly. The wetland replication area still falls short of the 75% coverage required, particularly in the ponded area. Horsley Witten has also noted that the eastern double lined basin may have reduced flood storage following the gas vent trench extension work. Bates will install a berm along the southeastern edge of the basin to restore any lost capacity.

Deviations from project approvals noted:

There were no deviations from project approvals during this reporting period.

Administrative Consent Order Schedule:

The Town entered into an Administrative Consent Order (ACO) with the MassDEP on November 29, 2022, to complete remaining landfill closure activities at the Ledge Road Landfill. The ACO requires that the landfill cap be substantially complete by June 30, 2025, and submission of a category BWP SW43 "Landfill Closure Completion" for the certification of closure construction by November 1, 2025. Following the development of the installed monitoring wells in March 2025, the project is considered substantially complete. It is currently anticipated that the project will be completed in accordance with the ACO schedule.

Photographs documenting the construction progress are attached.

Certification

I, Nathan E. Jones, attest under the pains and penalties of perjury that:

(a) I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification statement;

(b) based on my inquiry of those persons responsible for obtaining the information, the information contained in this submittal is, to the best of my knowledge, true, accurate, and complete;

(c) I am fully authorized to bind the entity required to submit these documents and to make this attestation on behalf of such entity; and

(d) I am aware that there are significant penalties, including, but not limited to, possible administrative and civil penalties for submitting false, inaccurate, or incomplete information and possible fines and imprisonment for knowingly submitting false, inaccurate, or incomplete information.

Please do not hesitate to contact me at (617) 452-6563 if you have any questions or need anything further.

Very truly yours,

Nathan E. Jones, P.E., PMP
Project Manager
CDM Smith Inc.

Attachments
- Photographs

c: Richard Spieler, John Morey, and Karen Stromberg, MassDEP
Carlos Jaquez, Town of Andover
Myles Johnson, CDM Smith

Grass swale leading to southern double-lined detention basin, facing Greenwood Road

Southern double-lined detention basin

Wetland replication area

Wetland replication area

Wetland replication area

Wetland replication area

Wetland replication area

Wetland Soil Removal Area 5

Wetland Soil Removal Area 5

Replaced culvert downstream of Wetland Soil Removal Area 4

Northern stormwater detention basin

Western side slope

Former Ledge Road along eastern edge of the landfill

Former Ledge Road along eastern edge of the landfill

Former Ledge Road along eastern edge of the landfill, facing Chandler Road

Appendix D Waste Relocation Sample Results

XREFs: [Wetland Survey Dwg - WSP 9.2.15, Final_Grading-Working, Full Site Survey Revised 5.11.16, C001GRPL, CDMS_2436, 20250827 andover sheet 3.liner, 20250827 ANDOVER. SHEET 1. CULVERT, 20250827 andover. sheet 2.subgrade, 20250915 ANDOVER. SHEET 4.FINAL GRADING] Images: []
Last saved by: YOUNGDK Time: 10/30/2025 11:35:29 AM
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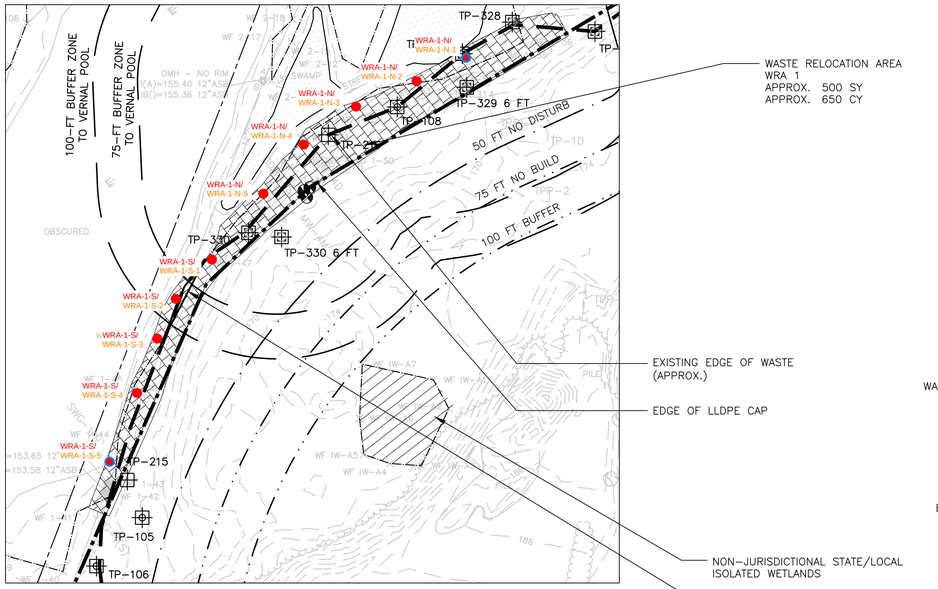


WASTE RELOCATION AREA
WRA 1
APPROX. 500 SY
APPROX. 650 CY

EXISTING EDGE OF WASTE (APPROX.)

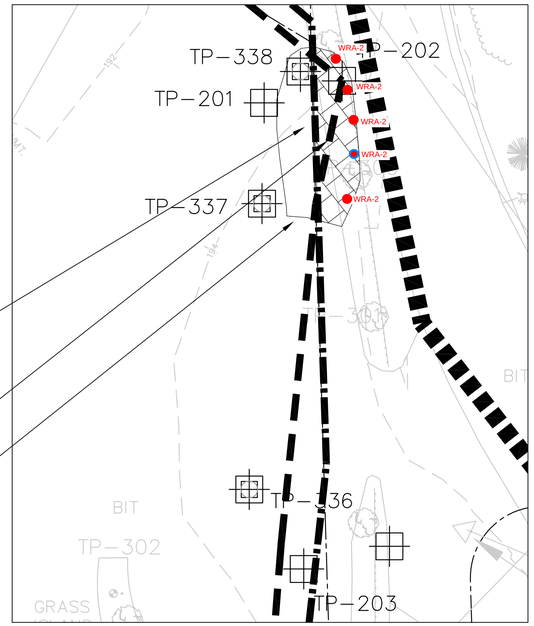
EDGE OF LLDPE CAP

NON-JURISDICTIONAL STATE/LOCAL ISOLATED WETLANDS

TEMPORARY ALTERATION TO BVW AREA: 80 SQUARE FEET

1" = 40'
20 0 40

WASTE RELOCATION FOCUS PLAN 1
PLAN 1 C-6
1"=40'



WASTE RELOCATION AREA
WRA 2
APPROX. 100 SY
APPROX. 150 CY

EXISTING EDGE OF WASTE (APPROX.)

EDGE OF LLDPE CAP

1" = 20'
10 0 20

WASTE RELOCATION FOCUS PLAN 2
PLAN 2 C-6
1"=20'

PROPOSED LEGEND

- WASTE RELOCATION AREA
- APPROX. EDGE OF WASTE
- EDGE OF LLDPE CAP

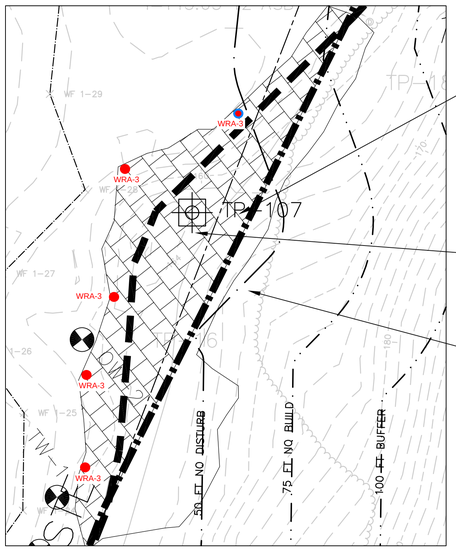
EXISTING LEGEND SEE SHEET G-2

GENERAL WASTE RELOCATION NOTES:

1. REFER TO SHEET C-5 FOR NOTES AND GENERAL SHEET VIEW DISTRIBUTION. REFER TO SHEET G-2 FOR GENERAL NOTES.
2. PROPOSED CAP SUBGRADE CONTOURS AND GRADES SHOWN ON SHEETS C-10 THROUGH C-13.
3. AT ALL WASTE RELOCATION AREAS, CONTRACTOR SHALL RETAIN A LICENSED LAND SURVEYOR TO CONFIRM AND STAKE THE LOCATION OF ALL PROPERTY LINES AND EASEMENTS PRIOR TO CONDUCTING ANY CONSTRUCTION ACTIVITIES ON-SITE.
4. CONTRACTOR MAY BE REQUIRED BY THE ENGINEER TO PERFORM FURTHER TEST PITS WITHIN THE PROPOSED WASTE RELOCATION AREAS TO CONFIRM EDGE OF WASTE AND DEPTHS.
5. MINIMIZE DISTURBANCE TO PRIVATE PROPERTY.
7. ALL WASTE SHALL BE RELOCATED TO WITHIN THE CAPPING LIMITS OUTSIDE PROPOSED DPW MATERIALS HANDLING AREA AND COVERED IN ACCORDANCE WITH MASSDEP REGULATIONS. SEE SHEET C-7 FOR SPECIFIC LOCATION.
8. CONTRACTOR SHALL PROVIDE PLAN PREPARED AND STAMPED BY A LICENSED LAND SURVEYOR SHOWING THE LOCATION OF ALL PROPERTY LINES AND EASEMENTS, LOCATION OF ANY UTILITIES, VERTICAL AND HORIZONTAL LIMITS OF EXCAVATION, LOCATION OF ANY CONFIRMATORY TESTING, FINAL EDGE OF LANDFILLED WASTE AND THE FINAL ELEVATIONS WITHIN ANY WASTE RELOCATION AREA PRIOR TO THE PLACEMENT OF THE LLDPE FML.

Waste Relocation Sample Key:

- Point location for 5-point composite sample/ Grab sample location after additional excavation (where applicable)
- VOC Grab Sample Location



WASTE RELOCATION AREA
WRA 3
APPROX. 200 SY
APPROX. 300 CY

EXISTING EDGE OF WASTE (APPROX.)

EDGE OF LLDPE CAP

1" = 20'
10 0 20

WASTE RELOCATION FOCUS PLAN 3
PLAN 3 C-6
1"=20'

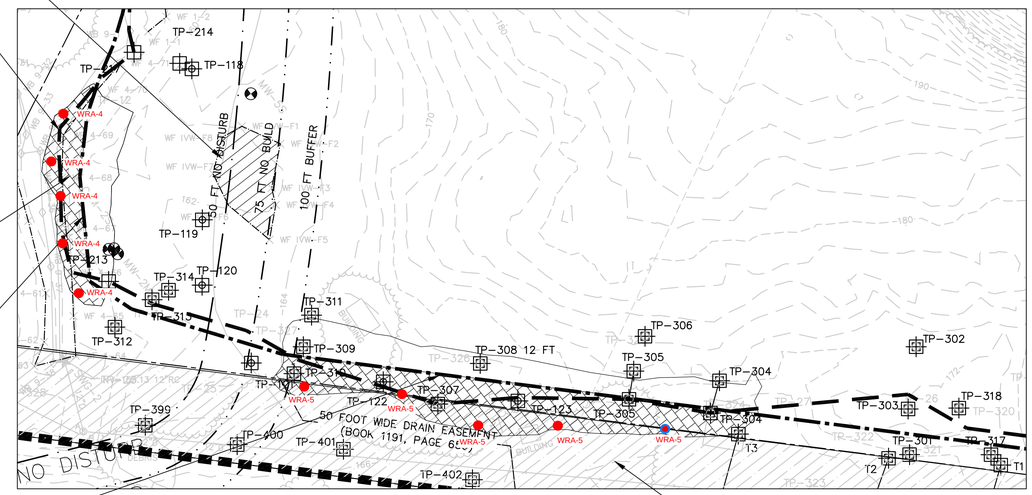
NON-JURISDICTIONAL STATE/LOCAL ISOLATED WETLANDS

EXISTING EDGE OF WASTE (APPROX.)

WASTE RELOCATION AREA
WRA 4
APPROX. 130 SY
APPROX. 170 CY

EDGE OF LLDPE CAP

WASTE RELOCATION AREA
WRA 5
APPROX. 350 SY
APPROX. 700 CY



TEMPORARY CONSTRUCTION EASEMENT TO BE DETERMINED

1" = 40'
20 0 40

WASTE RELOCATION FOCUS PLAN 4
PLAN 4 C-6
1"=40'

REV. NO.	DATE	DRWN	CHKD	REMARKS
3	10/2025	GKY	NEJ	REVISED TO REFLECT AS BUILT CONDITIONS
2	3/2023	JRH	NEJ	UPDATED FOR BIDDING
1	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE / DPW MATERIALS HANDLING AREA

DESIGNED BY: N. JONES
DRAWN BY: N. JONES
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: OCTOBER 2025

CDM Smith
75 State Street, Suite 701
Boston, MA 02109
Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

WASTE RELOCATION SAMPLING PLAN

PROJECT NO. 0235-113811
FILE NAME: C006WRLPRD.DWG
SHEET NO.

RECORD DRAWING

TABLE 1: LEDGE ROAD WRA RESULTS																					
CLIENT SAMPLE ID				WRA-1-N		WRA-1-S		WRA-1-N-1		WRA-1-N-2		WRA-1-N-3		WRA-1-N-4		WRA-1-N-5		WRA-1-S-1		WRA-1-S-2	
SAMPLING DATE				23-JAN-24		22-JAN-24		05-FEB-24		05-FEB-24		05-FEB-24		05-FEB-24		05-FEB-24		05-FEB-24		05-FEB-24	
LAB SAMPLE ID				L2403791-02		L2403791-01		L2406353-08		L2406353-07		L2406353-06		L2406353-05		L2406353-04		L2406353-03		L2406353-02	
	CAS Number	RCS-1-24	Units		Qual		Qual		Qual		Qual		Qual		Qual		Qual		Qual		Qual
General Chemistry																					
Solids, Total	---		%	**71.9**		**53.7**		**82.6**		**83.6**		**90.3**		**87.1**		**82.6**		**83.5**		**79.8**	
MCP Total Metals																					
Antimony, Total	7440-36-0	20	mg/kg	**4.05**		**26.6**		2.32	U	2.3	U	2.19	U	2.27	U	2.32	U	2.38	U	2.44	U
Arsenic, Total	7440-38-2	20	mg/kg	**9.07**		**16.5**		**13.5**		**5.34**		**6.3**		**86.8**		**0.662**		**0.893**		**1.89**	
Barium, Total	7440-39-3	1000	mg/kg	**72.7**		**496**		**39**		**12.2**		**19.5**		**39**		**8.84**		**12.3**		**21**	
Beryllium, Total	7440-41-7	100	mg/kg	**0.311**		**0.444**		**0.516**		**0.239**		**0.226**		**0.323**		0.232	U	0.238	U	0.244	U
Cadmium, Total	7440-43-9	80	mg/kg	**3.63**		**3.34**		0.465	U	0.46	U	0.437	U	0.454	U	0.464	U	0.476	U	0.488	U
Chromium, Total	7440-47-3	100	mg/kg	**18.8**		**23.6**		**24.7**		**11.5**		**10.4**		**23.3**		**6.74**		**8.15**		**12.9**	
Lead, Total	7439-92-1	200	mg/kg	**96.3**		**798**		**4.19**		**2.7**		**3.47**		**12**		2.32	U	2.38	U	**2.74**	
Mercury, Total	7439-97-6	20	mg/kg	0.095	U	0.142	U	0.091	U	0.087	U	0.083	U	0.083	U	0.087	U	0.088	U	0.091	U
Nickel, Total	7440-02-0	700	mg/kg	**15**		**22.1**		**15.7**		**12**		**11.1**		**16.2**		**5.64**		**7.69**		**11.7**	
Selenium, Total	7782-49-2	400	mg/kg	2.73	U	3.63	U	2.32	U	2.3	U	2.19	U	2.27	U	2.32	U	2.38	U	2.44	U
Silver, Total	7440-22-4	100	mg/kg	0.545	U	**0.872**		0.465	U	0.46	U	0.437	U	0.454	U	0.464	U	0.476	U	0.488	U
Thallium, Total	7440-28-0	8	mg/kg	2.73	U	3.63	U	2.32	U	2.3	U	2.19	U	2.27	U	2.32	U	2.38	U	2.44	U
Vanadium, Total	7440-62-2	500	mg/kg	**12.9**		**27.1**		**21.5**		**8.59**		**7.31**		**11.3**		**3.34**		**4.54**		**6.96**	
Zinc, Total	7440-66-6	1000	mg/kg	**1390**		**3040**		**28.2**		**11.9**		**33.7**		**64**		**4.79**		**11.4**		**19.7**	
MCP Volatile Organics by EPA 5035																					
1,1,1,2-Tetrachloroethane	630-20-6	0.1	mg/kg	0.0024	U	0.0046	U	NA		NA		NA		NA		NA		NA		NA	
1,1,1-Trichloroethane	71-55-6	30	mg/kg	0.0024	U	0.0046	U	NA		NA		NA		NA		NA		NA		NA	
1,1,2,2-Tetrachloroethane	79-34-5	0.005	mg/kg	0.0024	U	0.0046	U	NA		NA		NA		NA		NA		NA		NA	
1,1,2-Trichloroethane	79-00-5	0.1	mg/kg	0.0047	U	0.0092	U	NA		NA		NA		NA		NA		NA		NA	
1,1-Dichloroethane	75-34-3	0.4	mg/kg	0.0047	U	0.0092	U	NA		NA		NA		NA		NA		NA		NA	
1,1-Dichloroethene	75-35-4	3	mg/kg	0.0047	U	0.0092	U	NA		NA		NA		NA		NA		NA		NA	
1,1-Dichloropropene	563-58-6	---	mg/kg	0.0024	U	0.0046	U	NA		NA		NA		NA		NA		NA		NA	
1,2,3-Trichlorobenzene	87-61-6	---	mg/kg	0.0095	U	0.018	U	NA		NA		NA		NA		NA		NA		NA	
1,2,3-Trichloropropane	96-18-4	100	mg/kg	0.0095	U	0.018	U	NA		NA		NA		NA		NA		NA		NA	
1,2,4-Trichlorobenzene	120-82-1	2	mg/kg	0.0095	U	0.018	U	NA		NA		NA		NA		NA		NA		NA	
1,2,4-Trimethylbenzene	95-63-6	1000	mg/kg	0.0095	U	0.018	U	NA		NA		NA		NA		NA		NA		NA	
1,2-Dibromo-3-chloropropane	96-12-8	10	mg/kg	0.014	U	0.028	U	NA		NA		NA		NA		NA		NA		NA	
1,2-Dibromoethane	106-93-4	0.1	mg/kg	0.0047	U	0.0092	U	NA		NA		NA		NA		NA		NA		NA	
1,2-Dichlorobenzene	95-50-1	9	mg/kg	0.0095	U	0.018	U	NA		NA		NA		NA		NA		NA		NA	
1,2-Dichloroethane	107-06-2	0.1	mg/kg	0.0047	U	0.0092	U	NA		NA		NA		NA		NA		NA		NA	
1,2-Dichloroethene, Total	540-59-0	0.3	mg/kg	0.0047	U	0.0092	U	NA		NA		NA		NA		NA		NA		NA	
1,2-Dichloropropane	78-87-5	0.1	mg/kg	0.0047	U	0.0092	U	NA		NA		NA		NA		NA		NA		NA	
1,3,5-Trimethylbenzene	108-67-8	10	mg/kg	0.0095	U	0.018	U	NA		NA		NA		NA		NA		NA		NA	
1,3-Dichlorobenzene	541-73-1	3	mg/kg	0.0095	U	0.018	U	NA		NA		NA		NA		NA		NA		NA	
1,3-Dichloropropane	142-28-9	500	mg/kg	0.0095	U	0.018	U	NA		NA		NA		NA		NA		NA		NA	
1,3-Dichloropropene, Total	542-75-6	0.01	mg/kg	0.0024	U	0.0046	U	NA		NA		NA		NA		NA		NA		NA	
1,4-Dichlorobenzene	106-46-7	0.7	mg/kg	0.0095	U	0.018	U	NA		NA		NA		NA		NA		NA		NA	
1,4-Dioxane	123-91-1	0.2	mg/kg	0.38	U	0.74	U	NA		NA		NA		NA		NA		NA		NA	
2,2-Dichloropropane	594-20-7	---	mg/kg	0.0095	U	0.018	U	NA		NA		NA		NA		NA		NA		NA	
2-Hexanone	591-78-6	100	mg/kg	0.047	U	0.092	U	NA		NA		NA		NA		NA		NA		NA	
Acetone	67-64-1	6	mg/kg	0.12	U	**1.2**		NA		NA		NA		NA		NA		NA		NA	
Benzene	71-43-2	2	mg/kg	0.0024	U	0.0046	U	NA		NA		NA		NA		NA		NA		NA	
Bromobenzene	108-86-1	100	mg/kg	0.0095	U	0.018	U	NA		NA		NA		NA		NA		NA		NA	
Bromochloromethane	74-97-5	---	mg/kg	0.0095	U	0.018	U	NA		NA		NA		NA		NA		NA		NA	
Bromodichloromethane	75-27-4	0.1	mg/kg	0.0024	U	0.0046	U	NA		NA		NA		NA		NA		NA		NA	
Bromoform	75-25-2	0.1	mg/kg	0.019	U	0.037	U	NA		NA		NA		NA		NA		NA		NA	
Bromomethane	74-83-9	0.5	mg/kg	0.0095	U	0.018	U	NA		NA		NA		NA		NA		NA		NA	
Carbon disulfide	75-15-0	100	mg/kg	0.047	U	0.092	U	NA		NA		NA		NA		NA		NA		NA	
Carbon tetrachloride	56-23-5	5	mg/kg	0.0047	U	0.0092	U	NA		NA		NA		NA		NA		NA		NA	
Chlorobenzene	108-90-7	1	mg/kg	0.0024	U	0.0046	U	NA		NA		NA		NA		NA		NA		NA	
Chloroethane	75-00-3	100	mg/kg	0.0095	U	0.018	U	NA		NA		NA		NA		NA		NA		NA	
Chloroform	67-66-3	0.2	mg/kg	0.0071	U	0.014	U	NA		NA		NA		NA		NA		NA		NA	
Chloromethane	74-87-3	100	mg/kg	0.019	U	0.037	U	NA		NA		NA		NA		NA		NA		NA	
cis-1,2-Dichloroethene	156-59-2	0.1	mg/kg	0.0047	U	0.0092	U	NA		NA		NA		NA		NA		NA		NA	
cis-1,3-Dichloropropene	10061-01-5	0.01	mg/kg	0.0024	U	0.0046	U	NA		NA		NA		NA		NA		NA		NA	
Dibromochloromethane	124-48-1	0.005	mg/kg	0.0047	U	0.0092	U	NA		NA		NA		NA		NA		NA		NA	
Dibromomethane	74-95-3	500	mg/kg	0.0095	U	0.018	U	NA		NA		NA		NA		NA		NA		NA	
Dichlorodifluoromethane	75-71-8	1000	mg/kg	0.047	U	0.092	U	NA		NA		NA		NA		NA		NA		NA	
Diethyl ether	60-29-7	100	mg/kg	0.0095	U	0.018	U	NA		NA		NA		NA		NA		NA		NA	
Diisopropyl Ether	108-20-3	100	mg/kg	0.0095	U	0.018	U	NA		NA		NA		NA		NA		NA		NA	
Ethyl-Tert-Butyl-Ether	637-92-3	---	mg/kg	0.0095	U	0.018	U	NA		NA		NA		NA		NA		NA		NA	
Ethylbenzene	100-41-4	40	mg/kg	0.0047	U	0.0092	U	NA		NA		NA		NA		NA		NA		NA	
Hexachlorobutadiene	87-68-3	30	mg/kg	0.019	U	0.037	U	NA		NA		NA		NA		NA		NA		NA	
Isopropylbenzene	98-82-8	1000	mg/kg	0.0047	U	0.0092	U	NA		NA		NA		NA		NA		NA		NA	
Methyl ethyl ketone	78-93-3	4	mg/kg	0.047	U	**0.28**		NA		NA		NA		NA		NA		NA		NA	
Methyl isobutyl ketone	108-10-1	0.4	mg/kg	0.047	U	0.092	U	NA		NA		NA		NA		NA		NA		NA	
Methyl tert butyl ether	1634-04-4	0.1	mg/kg	0.0095	U	0.018	U	NA		NA		NA		NA		NA		NA		NA	
Methylene chloride	75-09-2	0.1	mg/kg	0.024	U	0.046	U	NA		NA		NA		NA		NA		NA		NA	
n-Butylbenzene	104-51-8	---	mg/kg	0.0047	U	0.0092	U	NA		NA		NA		NA		NA		NA		NA	
n-Propylbenzene	103-65-1	100	mg/kg	0.0047	U	0.0092	U	NA		NA		NA		NA		NA		NA		NA	
Naphthalene	91-20-3	4	mg/kg	0.019	U	0.037	U	NA		NA		NA		NA		NA		NA		NA	
o-Chlorotoluene	95-49-8	100	mg/kg	0.0095	U	0.018	U	NA		NA		NA		NA		NA		NA		NA	
o-Xylene	95-47-6	100	mg/kg	0.0047	U	0.0092	U	NA		NA		NA		NA		NA		NA		NA	
p-Chlorotoluene	106-43-4	---	mg/kg	0.0095	U	0.018	U	NA		NA		NA		NA		NA		NA		NA	
p-Isopropyltoluene	99-87-6	100	mg/kg	0.0047	U	0.0092	U	NA		NA		NA		NA		NA		NA		NA	
p/m-Xylene	179601-23-1	100	mg/kg	0.0095	U	0.018	U	NA		NA		NA		NA		NA		NA		NA	
sec-Butylbenzene	135-98-8	---	mg/kg	0.0047	U	0.0092	U	NA		NA		NA		NA		NA		NA		NA	
Styrene	100-42-5	3	mg/kg	0.0047	U	0.0092	U	NA		NA		NA		NA		NA		NA		NA	
tert-Butylbenzene	98-06-6	100	mg/kg	0.0095	U	0.018	U	NA		NA		NA		NA		NA		NA		NA	
Tertiary-Amyl Methyl Ether	994-05-8	---	mg/kg	0.0095	U	0.018	U	NA		NA		NA		NA		NA		NA		NA	
Tetrachloroethene	127-18-4	1	mg/kg	0.0024	U	0.0046	U	NA		NA		NA		NA		NA		NA		NA	
Tetrahydrofuran	109-99-9	500	mg/kg	0.019	U	0.037	U	NA		NA		NA		NA		NA		NA		NA	
Toluene	108-88-3	30	mg/kg	0.0047	U	0.0092	U	NA		NA		NA		NA		NA		NA		NA	
trans-1,2-Dichloroethene	156-60-5	1	mg/kg	0.0071	U	0.014	U	NA		NA		NA		NA		NA		NA		NA	
trans-1,3-Dichloropropene	10061-02-6	0.01	mg/kg	0.0047	U	0.0092	U	NA		NA		NA		NA		NA		NA		NA	
Trichloroethene	79-01-6	0.3	mg/kg	0.0024	U	0.0046	U	NA		NA		NA		NA		NA		NA		NA	
Trichlorofluoromethane	75-69-4	1000	mg/kg	0.019	U	0.037	U	NA		NA		NA		NA		NA		NA		NA	
Vinyl chloride	75-01-4	0.3	mg/kg	0.0047	U	0.0092	U	NA		NA		NA		NA		NA		NA		NA	
Xylenes, Total	1330-20-7	100	mg/kg	0.0047	U	0.0092	U	NA		NA		NA		NA		NA		NA		NA	
MCP 1,4 Dioxane by 8270E-SIM																					
1,4-Dioxane	123-91-1	0.2	mg/kg	NA		NA		NA		NA		NA		NA		NA		NA		NA	
MCP PAHs																					
2-Methylnaphthalene	91-57-6	0.7	mg/kg	0.097	U	0.13	U	NA		NA		NA		NA		NA		NA		NA	
Acenaphthene	83-32-9	4	mg/kg	0.18	U	0.24	U	NA		NA		NA		NA		NA		NA		NA	
Acenaphthylene	208-96-8	2	mg/kg	0.18	U	0.24	U	NA		NA		NA		NA		NA		NA		NA	
Anthracene	120-12-7	1000	mg/kg	0.14	U	0.18	U	NA		NA		NA		NA		NA		NA		NA	
Benzo(a)anthracene	56-55-3	20	mg/kg	0.14	U	**0.39**		NA		NA		NA		NA		NA		NA		NA	
Benzo(a)pyrene	50-32-8	2	mg/kg	0.18	U	**0.41**		NA		NA		NA		NA		NA		NA		NA	
Benzo(b)fluoranthene	205-99-2	20	mg/kg	0.14	U	**0.48**		NA		NA		NA		NA		NA		NA		NA	
Benzo(ghi)perylene	191-24-2	1000	mg/kg	0.18	U	0.24	U	NA		NA		NA		NA		NA		NA		NA	
Benzo(k)fluoranthene	207-08-9	200	mg/kg	0.14	U	**0.18**		NA		NA		NA		NA		NA		NA		NA	
Chrysene	218-01-9	200	mg/kg	0.14	U	**0.39**		NA		NA		NA		NA		NA		NA		NA	
Dibenzo(a,h)anthracene	53-70-3	2	mg/kg	0.097	U	0.13	U	NA		NA		NA		NA		NA		NA		NA	
Fluoranthene	206-44-0	1000	mg/kg	0.14	U	**0.6**		NA		NA		NA		NA		NA		NA		NA	
Fluorene	86-73-7	1000	mg/kg	0.23	U	0.3	U	NA		NA		NA		NA		NA		NA		NA	
Indeno(1,2,3-cd)pyrene	193-39-5	20	mg/kg	0.18	U	0.24	U	NA		NA		NA		NA		NA		NA		NA	
Naphthalene	91-20-3	4	mg/kg	0.23	U	0.3	U	NA		NA		NA		NA		NA		NA		NA	
Phenanthrene	85-01-8	10	mg/kg	0.14	U	**0.4**		NA		NA		NA		NA		NA		NA		NA	
Pyrene	129-00-0	1000	mg/kg	**0.14**		**0.65**		NA		NA		NA		NA		NA		NA		NA	
MCP Polychlorinated Biphenyls																					
Aroclor 1016	12674-11-2	1	mg/kg	0.0672	U	0.0925	U	NA		NA		NA		NA		NA		NA		NA	
Aroclor 1221	11104-28-2	1	mg/kg	0.0672	U	0.0925	U	NA		NA		NA		NA		NA		NA		NA	
Aroclor 1232	11141-16-5	1	mg/kg	0.0672	U	0.0925	U	NA		NA		NA		NA		NA		NA		NA	
Aroclor 1242	53469-21-9	1	mg/kg	0.0672	U	0.0925	U	NA		NA		NA		NA		NA		NA		NA	
Aroclor 1248	12672-29-6	1	mg/kg	0.0672	U	0.0925	U	NA		NA		NA		NA		NA		NA		NA	
Aroclor 1254	11097-69-1	1	mg/kg	0.0672	U	0.0925	U	NA		NA		NA		NA		NA		NA		NA	
Aroclor 1260	11096-82-5	1	mg/kg	0.0672	U	0.0925	U	NA		NA		NA		NA		NA		NA		NA	
Aroclor 1262	37324-23-5	1	mg/kg	0.0672	U	0.0925	U	NA		NA		NA		NA		NA		NA		NA	
Aroclor 1268	11100-14-4	1	mg/kg	0.0672	U	0.0925	U	NA		NA		NA		NA		NA		NA		NA	
PCBs, Total	1336-36-3	1	mg/kg	0.0672	U	0.0925	U	NA		NA		NA		NA		NA		NA		NA	
Petroleum Hydrocarbon Quantitation																					
TPH (C10-C36)	---	1000	mg/kg	44.6	U	**236**		NA		NA		NA		NA		NA		NA		NA	

TABLE 1: LEDGE ROAD WRA RESULTS																			
CLIENT SAMPLE ID				WRA-1-S-3		WRA-1-S-4		WRA-1-S-5		WRA-2		WRA-2		WRA-3		WRA-4		WRA-5	
SAMPLING DATE				05-FEB-24		05-FEB-24		05-FEB-24		05-FEB-24		23-Feb-24		03-JAN-24		03-JAN-24		02-JAN-24	
LAB SAMPLE ID				L2406353-10		L2406353-11		L2406353-09		L2406353-01		L2408857-01		L2400301-01		L2400301-02		L2400193-01	
	CAS Number	RCS-1-24	Units		Qual		Qual		Qual		Qual		Qual		Qual		Qual		Qual
General Chemistry																			
Solids, Total	---		%	**81.8**		**85**		**84.1**		**86.3**		**86.3**		**85.2**		**73.4**		**86.6**	
MCP Total Metals																			
Antimony, Total	7440-36-0	20	mg/kg	2.42	U	2.34	U	2.3	U	**3.51**		NA		2.34	U	2.66	U	2.26	U
Arsenic, Total	7440-38-2	20	mg/kg	**1.75**		**2.63**		**6.58**		**6.72**		NA		**10.9**		**9.07**		**11.6**	
Barium, Total	7440-39-3	1000	mg/kg	**8.33**		**23.4**		**46.4**		**80.7**		NA		**16.1**		**27.8**		**30**	
Beryllium, Total	7440-41-7	100	mg/kg	0.242	U	0.234	U	**0.38**		**0.468**		NA		**0.457**		0.266	U	**0.427**	
Cadmium, Total	7440-43-9	80	mg/kg	0.483	U	0.468	U	**15.7**		**0.453**		NA		0.467	U	0.533	U	0.452	U
Chromium, Total	7440-47-3	100	mg/kg	**4.81**		**15.5**		**16.6**		**13.4**		NA		**23.9**		**15.2**		**21**	
Lead, Total	7439-92-1	200	mg/kg	**2.91**		**3.4**		**24.5**		**34**		NA		**8.48**		**21.4**		**7.5**	
Mercury, Total	7439-97-6	20	mg/kg	0.09	U	0.084	U	0.089	U	**0.088**		NA		0.085	U	0.099	U	0.085	U
Nickel, Total	7440-02-0	700	mg/kg	**8.07**		**11.5**		**13.7**		**11.3**		NA		**19.1**		**9.22**		**18**	
Selenium, Total	7782-49-2	400	mg/kg	2.42	U	2.34	U	2.3	U	2.23	U	NA		2.34	U	2.66	U	2.26	U
Silver, Total	7440-22-4	100	mg/kg	0.483	U	0.468	U	0.46	U	0.446	U	NA		0.467	U	0.533	U	0.452	U
Thallium, Total	7440-28-0	8	mg/kg	2.42	U	2.34	U	2.3	U	2.23	U	NA		2.34	U	2.66	U	2.26	U
Vanadium, Total	7440-62-2	500	mg/kg	**3.06**		**10.6**		**9.96**		**9.69**		NA		**17.4**		**12.1**		**13.9**	
Zinc, Total	7440-66-6	1000	mg/kg	**14.1**		**25.4**		**114**		**228**		NA		**56.9**		**34.3**		**27.2**	
MCP Volatile Organics by EPA 5035																			
1,1,1,2-Tetrachloroethane	630-20-6	0.1	mg/kg	NA		NA		NA		0.0026	U	NA		0.00095	U	0.0018	U	0.0018	U
1,1,1-Trichloroethane	71-55-6	30	mg/kg	NA		NA		NA		0.0026	U	NA		0.00095	U	0.0018	U	0.0018	U
1,1,2,2-Tetrachloroethane	79-34-5	0.005	mg/kg	NA		NA		NA		0.0026	U	NA		0.00095	U	0.0018	U	0.0018	U
1,1,2-Trichloroethane	79-00-5	0.1	mg/kg	NA		NA		NA		0.0052	U	NA		0.0019	U	0.0037	U	0.0036	U
1,1-Dichloroethane	75-34-3	0.4	mg/kg	NA		NA		NA		0.0052	U	NA		0.0019	U	0.0037	U	0.0036	U
1,1-Dichloroethene	75-35-4	3	mg/kg	NA		NA		NA		0.0052	U	NA		0.0019	U	0.0037	U	0.0036	U
1,1-Dichloropropene	563-58-6	---	mg/kg	NA		NA		NA		0.0026	U	NA		0.00095	U	0.0018	U	0.0018	U
1,2,3-Trichlorobenzene	87-61-6	---	mg/kg	NA		NA		NA		0.01	U	NA		0.0038	U	0.0074	U	0.0072	U
1,2,3-Trichloropropane	96-18-4	100	mg/kg	NA		NA		NA		0.01	U	NA		0.0038	U	0.0074	U	0.0072	U
1,2,4-Trichlorobenzene	120-82-1	2	mg/kg	NA		NA		NA		0.01	U	NA		0.0038	U	0.0074	U	0.0072	U
1,2,4-Trimethylbenzene	95-63-6	1000	mg/kg	NA		NA		NA		0.01	U	NA		0.0038	U	0.0074	U	0.0072	U
1,2-Dibromo-3-chloropropane	96-12-8	10	mg/kg	NA		NA		NA		0.016	U	NA		0.0057	U	0.011	U	0.011	U
1,2-Dibromoethane	106-93-4	0.1	mg/kg	NA		NA		NA		0.0052	U	NA		0.0019	U	0.0037	U	0.0036	U
1,2-Dichlorobenzene	95-50-1	9	mg/kg	NA		NA		NA		0.01	U	NA		0.0038	U	**0.019**		0.0072	U
1,2-Dichloroethane	107-06-2	0.1	mg/kg	NA		NA		NA		0.0052	U	NA		0.0019	U	0.0037	U	0.0036	U
1,2-Dichloroethene, Total	540-59-0	0.3	mg/kg	NA		NA		NA		0.0052	U	NA		0.0019	U	0.0037	U	0.0036	U
1,2-Dichloropropane	78-87-5	0.1	mg/kg	NA		NA		NA		0.0052	U	NA		0.0019	U	0.0037	U	0.0036	U
1,3,5-Trimethylbenzene	108-67-8	10	mg/kg	NA		NA		NA		0.01	U	NA		0.0038	U	0.0074	U	0.0072	U
1,3-Dichlorobenzene	541-73-1	3	mg/kg	NA		NA		NA		0.01	U	NA		0.0038	U	0.0074	U	0.0072	U
1,3-Dichloropropane	142-28-9	500	mg/kg	NA		NA		NA		0.01	U	NA		0.0038	U	0.0074	U	0.0072	U
1,3-Dichloropropene, Total	542-75-6	0.01	mg/kg	NA		NA		NA		0.0026	U	NA		0.00095	U	0.0018	U	0.0018	U
1,4-Dichlorobenzene	106-46-7	0.7	mg/kg	NA		NA		NA		0.01	U	NA		0.0038	U	**0.04**		0.0072	U
1,4-Dioxane	123-91-1	0.2	mg/kg	NA		NA		NA		0.42	U	NA		0.15	U	0.29	U	0.29	U
2,2-Dichloropropane	594-20-7	---	mg/kg	NA		NA		NA		0.01	U	NA		0.0038	U	0.0074	U	0.0072	U
2-Hexanone	591-78-6	100	mg/kg	NA		NA		NA		0.052	U	NA		0.019	U	0.037	U	0.036	U
Acetone	67-64-1	6	mg/kg	NA		NA		NA		0.13	U	NA		0.047	U	0.092	U	0.09	U
Benzene	71-43-2	2	mg/kg	NA		NA		NA		0.0026	U	NA		0.00095	U	**0.0044**		0.0018	U
Bromobenzene	108-86-1	100	mg/kg	NA		NA		NA		0.01	U	NA		0.0038	U	0.0074	U	0.0072	U
Bromochloromethane	74-97-5	---	mg/kg	NA		NA		NA		0.01	U	NA		0.0038	U	0.0074	U	0.0072	U
Bromodichloromethane	75-27-4	0.1	mg/kg	NA		NA		NA		0.0026	U	NA		0.00095	U	0.0018	U	0.0018	U
Bromoform	75-25-2	0.1	mg/kg	NA		NA		NA		0.021	U	NA		0.0076	U	0.015	U	0.014	U
Bromomethane	74-83-9	0.5	mg/kg	NA		NA		NA		0.01	U	NA		0.0038	U	0.0074	U	0.0072	U
Carbon disulfide	75-15-0	100	mg/kg	NA		NA		NA		0.052	U	NA		0.019	U	0.037	U	0.036	U
Carbon tetrachloride	56-23-5	5	mg/kg	NA		NA		NA		0.0052	U	NA		0.0019	U	0.0037	U	0.0036	U
Chlorobenzene	108-90-7	1	mg/kg	NA		NA		NA		0.0026	U	NA		0.00095	U	**0.19**		0.0018	U
Chloroethane	75-00-3	100	mg/kg	NA		NA		NA		0.01	U	NA		0.0038	U	0.0074	U	0.0072	U
Chloroform	67-66-3	0.2	mg/kg	NA		NA		NA		0.0078	U	NA		0.0028	U	0.0055	U	0.0054	U
Chloromethane	74-87-3	100	mg/kg	NA		NA		NA		0.021	U	NA		0.0076	U	0.015	U	0.014	U
cis-1,2-Dichloroethene	156-59-2	0.1	mg/kg	NA		NA		NA		0.0052	U	NA		0.0019	U	0.0037	U	0.0036	U
cis-1,3-Dichloropropene	10061-01-5	0.01	mg/kg	NA		NA		NA		0.0026	U	NA		0.00095	U	0.0018	U	0.0018	U
Dibromochloromethane	124-48-1	0.005	mg/kg	NA		NA		NA		0.0052	U	NA		0.0019	U	0.0037	U	0.0036	U
Dibromomethane	74-95-3	500	mg/kg	NA		NA		NA		0.01	U	NA		0.0038	U	0.0074	U	0.0072	U
Dichlorodifluoromethane	75-71-8	1000	mg/kg	NA		NA		NA		0.052	U	NA		0.019	U	0.037	U	0.036	U
Diethyl ether	60-29-7	100	mg/kg	NA		NA		NA		0.01	U	NA		0.0038	U	0.0074	U	0.0072	U
Diisopropyl Ether	108-20-3	100	mg/kg	NA		NA		NA		0.01	U	NA		0.0038	U	0.0074	U	0.0072	U
Ethyl-Tert-Butyl-Ether	637-92-3	---	mg/kg	NA		NA		NA		0.01	U	NA		0.0038	U	0.0074	U	0.0072	U
Ethylbenzene	100-41-4	40	mg/kg	NA		NA		NA		0.0052	U	NA		0.0019	U	0.0037	U	0.0036	U
Hexachlorobutadiene	87-68-3	30	mg/kg	NA		NA		NA		0.021	U	NA		0.0076	U	0.015	U	0.014	U
Isopropylbenzene	98-82-8	1000	mg/kg	NA		NA		NA		0.0052	U	NA		0.0019	U	**0.011**		0.0036	U
Methyl ethyl ketone	78-93-3	4	mg/kg	NA		NA		NA		0.052	U	NA		0.019	U	0.037	U	0.036	U
Methyl isobutyl ketone	108-10-1	0.4	mg/kg	NA		NA		NA		0.052	U	NA		0.019	U	0.037	U	0.036	U
Methyl tert butyl ether	1634-04-4	0.1	mg/kg	NA		NA		NA		0.01	U	NA		0.0038	U	0.0074	U	0.0072	U
Methylene chloride	75-09-2	0.1	mg/kg	NA		NA		NA		0.026	U	NA		0.0095	U	0.018	U	0.018	U
n-Butylbenzene	104-51-8	---	mg/kg	NA		NA		NA		0.0052	U	NA		0.0019	U	0.0037	U	0.0036	U
n-Propylbenzene	103-65-1	100	mg/kg	NA		NA		NA		0.0052	U	NA		0.0019	U	0.0037	U	0.0036	U
Naphthalene	91-20-3	4	mg/kg	NA		NA		NA		0.021	U	NA		0.0076	U	0.015	U	0.014	U
o-Chlorotoluene	95-49-8	100	mg/kg	NA		NA		NA		0.01	U	NA		0.0038	U	0.0074	U	0.0072	U
o-Xylene	95-47-6	100	mg/kg	NA		NA		NA		0.0052	U	NA		0.0019	U	0.0037	U	0.0036	U
p-Chlorotoluene	106-43-4	---	mg/kg	NA		NA		NA		0.01	U	NA		0.0038	U	0.0074	U	0.0072	U
p-Isopropyltoluene	99-87-6	100	mg/kg	NA		NA		NA		0.0052	U	NA		0.0019	U	0.0037	U	0.0036	U
p/m-Xylene	179601-23-1	100	mg/kg	NA		NA		NA		0.01	U	NA		0.0038	U	**0.011**		0.0072	U
sec-Butylbenzene	135-98-8	---	mg/kg	NA		NA		NA		0.0052	U	NA		0.0019	U	0.0037	U	0.0036	U
Styrene	100-42-5	3	mg/kg	NA		NA		NA		0.0052	U	NA		0.0019	U	0.0037	U	0.0036	U
tert-Butylbenzene	98-06-6	100	mg/kg	NA		NA		NA		0.01	U	NA		0.0038	U	0.0074	U	0.0072	U
Tertiary-Amyl Methyl Ether	994-05-8	---	mg/kg	NA		NA		NA		0.01	U	NA		0.0038	U	0.0074	U	0.0072	U
Tetrachloroethene	127-18-4	1	mg/kg	NA		NA		NA		0.0026	U	NA		0.00095	U	0.0018	U	0.0018	U
Tetrahydrofuran	109-99-9	500	mg/kg	NA		NA		NA		0.021	U	NA		0.0076	U	0.015	U	0.014	U
Toluene	108-88-3	30	mg/kg	NA		NA		NA		0.0052	U	NA		0.0019	U	0.0037	U	0.0036	U
trans-1,2-Dichloroethene	156-60-5	1	mg/kg	NA		NA		NA		0.0078	U	NA		0.0028	U	0.0055	U	0.0054	U
trans-1,3-Dichloropropene	10061-02-6	0.01	mg/kg	NA		NA		NA		0.0052	U	NA		0.0019	U	0.0037	U	0.0036	U
Trichloroethene	79-01-6	0.3	mg/kg	NA		NA		NA		0.0026	U	NA		0.00095	U	0.0018	U	0.0018	U
Trichlorofluoromethane	75-69-4	1000	mg/kg	NA		NA		NA		0.021	U	NA		0.0076	U	0.015	U	0.014	U
Vinyl chloride	75-01-4	0.3	mg/kg	NA		NA		NA		0.0052	U	NA		0.0019	U	0.0037	U	0.0036	U
Xylenes, Total	1330-20-7	100	mg/kg	NA		NA		NA		0.0052	U	NA		0.0019	U	**0.011**		0.0036	U
MCP 1,4 Dioxane by 8270E-SIM																			
1,4-Dioxane	123-91-1	0.2	mg/kg	NA		NA		NA		NA		0.008	U	NA		0.0104	U	0.00822	U
MCP PAHs																			
2-Methylnaphthalene	91-57-6	0.7	mg/kg	NA		NA		NA		0.08	U	NA		0.081	U	0.094	U	0.08	U
Acenaphthene	83-32-9	4	mg/kg	NA		NA		NA		0.15	U	NA		0.15	U	0.18	U	0.15	U
Acenaphthylene	208-96-8	2	mg/kg	NA		NA		NA		0.15	U	NA		0.15	U	**0.18**		0.15	U
Anthracene	120-12-7	1000	mg/kg	NA		NA		NA		0.11	U	NA		0.12	U	0.13	U	0.11	U
Benzo(a)anthracene	56-55-3	20	mg/kg	NA		NA		NA		0.11	U	NA		0.12	U	**0.34**		0.11	U
Benzo(a)pyrene	50-32-8	2	mg/kg	NA		NA		NA		0.15	U	NA		0.15	U	**0.34**		0.15	U
Benzo(b)fluoranthene	205-99-2	20	mg/kg	NA		NA		NA		0.11	U	NA		0.12	U	**0.36**		0.11	U
Benzo(ghi)perylene	191-24-2	1000	mg/kg	NA		NA		NA		0.15	U	NA		0.15	U	**0.2**		0.15	U
Benzo(k)fluoranthene	207-08-9	200	mg/kg	NA		NA		NA		0.11	U	NA		0.12	U	**0.13**		0.11	U
Chrysene	218-01-9	200	mg/kg	NA		NA		NA		**0.11**		NA		0.12	U	**0.42**		0.11	U
Dibenzo(a,h)anthracene	53-70-3	2	mg/kg	NA		NA		NA		0.08	U	NA		0.081	U	0.094	U	0.08	U
Fluoranthene	206-44-0	1000	mg/kg	NA		NA		NA		**0.16**		NA		0.12	U	**0.51**		0.11	U
Fluorene	86-73-7	1000	mg/kg	NA		NA		NA		0.19	U	NA		0.19	U	0.22	U	0.19	U
Indeno(1,2,3-cd)pyrene	193-39-5	20	mg/kg	NA		NA		NA		0.15	U	NA		0.15	U	**0.21**		0.15	U
Naphthalene	91-20-3	4	mg/kg	NA		NA		NA		0.19	U	NA		0.19	U	0.22	U	0.19	U
Phenanthrene	85-01-8	10	mg/kg	NA		NA		NA		**0.19**		NA		0.12	U	**0.26**		0.11	U
Pyrene	129-00-0	1000	mg/kg	NA		NA		NA		**0.22**		NA		0.12	U	**0.64**		0.11	U
MCP Polychlorinated Biphenyls																			
Aroclor 1016	12674-11-2	1	mg/kg	NA		NA		NA		0.0559	U	NA		0.0568	U	0.0624	U	0.0559	U
Aroclor 1221	11104-28-2	1	mg/kg	NA		NA		NA		0.0559	U	NA		0.0568	U	0.0624	U	0.0559	U
Aroclor 1232	11141-16-5	1	mg/kg	NA		NA		NA		0.0559	U	NA		0.0568	U	0.0624	U	0.0559	U
Aroclor 1242	53469-21-9	1	mg/kg	NA		NA		NA		0.0559	U	NA		0.0568	U	**0.154**		0.0559	U
Aroclor 1248	12672-29-6	1	mg/kg	NA		NA		NA		0.0559	U	NA		0.0568	U	0.0624	U	0.0559	U
Aroclor 1254	11097-69-1	1	mg/kg	NA		NA		NA		0.0559	U	NA		0.0568	U	0.0624	U	0.0559	U
Aroclor 1260	11096-82-5	1	mg/kg	NA		NA		NA		0.0559	U	NA		0.0568	U	0.0624	U	0.0559	U
Aroclor 1262	37324-23-5	1	mg/kg	NA		NA		NA		0.0559	U	NA		0.0568	U	0.0624	U	0.0559	U
Aroclor 1268	11100-14-4	1	mg/kg	NA		NA		NA		0.0559	U	NA		0.0568	U	0.0624	U	0.0559	U
PCBs, Total	1336-36-3	1	mg/kg	NA		NA		NA		0.0559	U	NA		0.0568	U	**0.154**		0.0559	U
Petroleum Hydrocarbon Quantitation																			
TPH (C10-C36)	---	1000	mg/kg	NA		NA		NA		37.3	U	NA		37.1	U	**120**		37	U

ANALYTICAL REPORT

Lab Number:	L2400193
Client:	CDM Smith, Inc. 75 State Street Suite 701 Boston, MA 02109
ATTN:	Nathan Jones
Phone:	(617) 452-6563
Project Name:	LEDGE RD LANDFILL
Project Number:	289302
Report Date:	01/12/24

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Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2400193
Report Date: 01/12/24

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2400193-01	WRA-5	SOIL	ANDOVER, MA	01/02/24 13:30	01/03/24

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400193

Project Number: 289302 **Report Date:** 01/12/24

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	NO

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2400193
Project Number:	289302	**Report Date:**	01/12/24

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2400193
Project Number:	289302	**Report Date:**	01/12/24

Case Narrative (continued)

Report Submission

January 12, 2024: This final report includes the results of all requested analyses.

January 05, 2024: This is a preliminary report.

MCP Related Narratives

Sample Receipt

In reference to question H:

A Matrix Spike was not submitted for the analysis of Total Metals..

Volatile Organics

L2400193-01: Initial calibration utilized a quadratic fit for: 1,1,1,2-tetrachloroethane

In reference to question H:

L2400193-01: Initial Calibration did not meet:

Lowest Calibration Standard Minimum Response Factor: trichloroethene (0.1904), bromodichloromethane (0.2472), 1,4-dioxane (0.0032), cis-1,3-dichloropropene (0.2490)

Average Response Factor: 1,4-dioxane

Verification: dichlorodifluoromethane (62%)

L2400193-01: The associated continuing calibration standard is outside the acceptance criteria for several compounds; however, it is within overall method allowances. Associated results are considered to be biased high if the %D is negative and biased low if the %D is positive. A copy of the continuing calibration standard is included as an addendum to this report.

PAHs

In reference to question I:

All samples were analyzed for a subset of MCP analytes per client request.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Cristin Walker Cristin Walker

Title: Technical Director/Representative Date: 01/12/24

QC OUTLIER SUMMARY REPORT

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2400193
Report Date: 01/12/24

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment
MCP Volatile Organics by EPA 5035 Low - Westborough Lab								
8260D	Batch QC	WG1871046-3	Dichlorodifluoromethane	LCS	50	70-130	01	potential low bias
8260D	Batch QC	WG1871046-3	Diisopropyl Ether	LCS	140	70-130	01	potential high bias
8260D	Batch QC	WG1871046-4	Dichlorodifluoromethane	LCSD	48	70-130	01	potential low bias
8260D	Batch QC	WG1871046-4	Acetone	LCSD	29	20	01	non-directional bias

ORGANICS

VOLATILES

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400193

Project Number: 289302 **Report Date:** 01/12/24

SAMPLE RESULTS

Lab ID: L2400193-01 Date Collected: 01/02/24 13:30
Client ID: WRA-5 Date Received: 01/03/24
Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8260D
Analytical Date: 01/04/24 11:04
Analyst: AJK
Percent Solids: 87%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Methylene chloride	ND		ug/kg	18	--	1
1,1-Dichloroethane	ND		ug/kg	3.6	--	1
Chloroform	ND		ug/kg	5.4	--	1
Carbon tetrachloride	ND		ug/kg	3.6	--	1
1,2-Dichloropropane	ND		ug/kg	3.6	--	1
Dibromochloromethane	ND		ug/kg	3.6	--	1
1,1,2-Trichloroethane	ND		ug/kg	3.6	--	1
Tetrachloroethene	ND		ug/kg	1.8	--	1
Chlorobenzene	ND		ug/kg	1.8	--	1
Trichlorofluoromethane	ND		ug/kg	14	--	1
1,2-Dichloroethane	ND		ug/kg	3.6	--	1
1,1,1-Trichloroethane	ND		ug/kg	1.8	--	1
Bromodichloromethane	ND		ug/kg	1.8	--	1
trans-1,3-Dichloropropene	ND		ug/kg	3.6	--	1
cis-1,3-Dichloropropene	ND		ug/kg	1.8	--	1
1,3-Dichloropropene, Total	ND		ug/kg	1.8	--	1
1,1-Dichloropropene	ND		ug/kg	1.8	--	1
Bromoform	ND		ug/kg	14	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.8	--	1
Benzene	ND		ug/kg	1.8	--	1
Toluene	ND		ug/kg	3.6	--	1
Ethylbenzene	ND		ug/kg	3.6	--	1
Chloromethane	ND		ug/kg	14	--	1
Bromomethane	ND		ug/kg	7.2	--	1
Vinyl chloride	ND		ug/kg	3.6	--	1
Chloroethane	ND		ug/kg	7.2	--	1
1,1-Dichloroethene	ND		ug/kg	3.6	--	1
trans-1,2-Dichloroethene	ND		ug/kg	5.4	--	1

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400193

Project Number: 289302 **Report Date:** 01/12/24

SAMPLE RESULTS

Lab ID: L2400193-01 Date Collected: 01/02/24 13:30

Client ID: WRA-5 Date Received: 01/03/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Trichloroethene	ND		ug/kg	1.8	--	1
1,2-Dichlorobenzene	ND		ug/kg	7.2	--	1
1,3-Dichlorobenzene	ND		ug/kg	7.2	--	1
1,4-Dichlorobenzene	ND		ug/kg	7.2	--	1
Methyl tert butyl ether	ND		ug/kg	7.2	--	1
p/m-Xylene	ND		ug/kg	7.2	--	1
o-Xylene	ND		ug/kg	3.6	--	1
Xylenes, Total	ND		ug/kg	3.6	--	1
cis-1,2-Dichloroethene	ND		ug/kg	3.6	--	1
1,2-Dichloroethene, Total	ND		ug/kg	3.6	--	1
Dibromomethane	ND		ug/kg	7.2	--	1
1,2,3-Trichloropropane	ND		ug/kg	7.2	--	1
Styrene	ND		ug/kg	3.6	--	1
Dichlorodifluoromethane	ND		ug/kg	36	--	1
Acetone	ND		ug/kg	90	--	1
Carbon disulfide	ND		ug/kg	36	--	1
Methyl ethyl ketone	ND		ug/kg	36	--	1
Methyl isobutyl ketone	ND		ug/kg	36	--	1
2-Hexanone	ND		ug/kg	36	--	1
Bromochloromethane	ND		ug/kg	7.2	--	1
Tetrahydrofuran	ND		ug/kg	14	--	1
2,2-Dichloropropane	ND		ug/kg	7.2	--	1
1,2-Dibromoethane	ND		ug/kg	3.6	--	1
1,3-Dichloropropane	ND		ug/kg	7.2	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.8	--	1
Bromobenzene	ND		ug/kg	7.2	--	1
n-Butylbenzene	ND		ug/kg	3.6	--	1
sec-Butylbenzene	ND		ug/kg	3.6	--	1
tert-Butylbenzene	ND		ug/kg	7.2	--	1
o-Chlorotoluene	ND		ug/kg	7.2	--	1
p-Chlorotoluene	ND		ug/kg	7.2	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	11	--	1
Hexachlorobutadiene	ND		ug/kg	14	--	1
Isopropylbenzene	ND		ug/kg	3.6	--	1
p-Isopropyltoluene	ND		ug/kg	3.6	--	1
Naphthalene	ND		ug/kg	14	--	1
n-Propylbenzene	ND		ug/kg	3.6	--	1

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400193

Project Number: 289302 **Report Date:** 01/12/24

SAMPLE RESULTS

Lab ID: L2400193-01 Date Collected: 01/02/24 13:30

Client ID: WRA-5 Date Received: 01/03/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	7.2	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	7.2	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	7.2	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	7.2	--	1
Diethyl ether	ND		ug/kg	7.2	--	1
Diisopropyl Ether	ND		ug/kg	7.2	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	7.2	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	7.2	--	1
1,4-Dioxane	ND		ug/kg	290	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	112		70-130
Toluene-d8	96		70-130
4-Bromofluorobenzene	100		70-130
Dibromofluoromethane	98		70-130

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400193

Project Number: 289302 **Report Date:** 01/12/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 01/04/24 09:41
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1871046-5					
Methylene chloride	ND		ug/kg	5.0	--
1,1-Dichloroethane	ND		ug/kg	1.0	--
Chloroform	ND		ug/kg	1.5	--
Carbon tetrachloride	ND		ug/kg	1.0	--
1,2-Dichloropropane	ND		ug/kg	1.0	--
Dibromochloromethane	ND		ug/kg	1.0	--
1,1,2-Trichloroethane	ND		ug/kg	1.0	--
Tetrachloroethene	ND		ug/kg	0.50	--
Chlorobenzene	ND		ug/kg	0.50	--
Trichlorofluoromethane	ND		ug/kg	4.0	--
1,2-Dichloroethane	ND		ug/kg	1.0	--
1,1,1-Trichloroethane	ND		ug/kg	0.50	--
Bromodichloromethane	ND		ug/kg	0.50	--
trans-1,3-Dichloropropene	ND		ug/kg	1.0	--
cis-1,3-Dichloropropene	ND		ug/kg	0.50	--
1,3-Dichloropropene, Total	ND		ug/kg	0.50	--
1,1-Dichloropropene	ND		ug/kg	0.50	--
Bromoform	ND		ug/kg	4.0	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.50	--
Benzene	ND		ug/kg	0.50	--
Toluene	ND		ug/kg	1.0	--
Ethylbenzene	ND		ug/kg	1.0	--
Chloromethane	ND		ug/kg	4.0	--
Bromomethane	ND		ug/kg	2.0	--
Vinyl chloride	ND		ug/kg	1.0	--
Chloroethane	ND		ug/kg	2.0	--
1,1-Dichloroethene	ND		ug/kg	1.0	--
trans-1,2-Dichloroethene	ND		ug/kg	1.5	--
Trichloroethene	ND		ug/kg	0.50	--

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400193

Project Number: 289302 **Report Date:** 01/12/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 01/04/24 09:41
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1871046-5					
1,2-Dichlorobenzene	ND		ug/kg	2.0	--
1,3-Dichlorobenzene	ND		ug/kg	2.0	--
1,4-Dichlorobenzene	ND		ug/kg	2.0	--
Methyl tert butyl ether	ND		ug/kg	2.0	--
p/m-Xylene	ND		ug/kg	2.0	--
o-Xylene	ND		ug/kg	1.0	--
Xylenes, Total	ND		ug/kg	1.0	--
cis-1,2-Dichloroethene	ND		ug/kg	1.0	--
1,2-Dichloroethene, Total	ND		ug/kg	1.0	--
Dibromomethane	ND		ug/kg	2.0	--
1,2,3-Trichloropropane	ND		ug/kg	2.0	--
Styrene	ND		ug/kg	1.0	--
Dichlorodifluoromethane	ND		ug/kg	10	--
Acetone	ND		ug/kg	25	--
Carbon disulfide	ND		ug/kg	10	--
Methyl ethyl ketone	ND		ug/kg	10	--
Methyl isobutyl ketone	ND		ug/kg	10	--
2-Hexanone	ND		ug/kg	10	--
Bromochloromethane	ND		ug/kg	2.0	--
Tetrahydrofuran	ND		ug/kg	4.0	--
2,2-Dichloropropane	ND		ug/kg	2.0	--
1,2-Dibromoethane	ND		ug/kg	1.0	--
1,3-Dichloropropane	ND		ug/kg	2.0	--
1,1,1,2-Tetrachloroethane	ND		ug/kg	0.50	--
Bromobenzene	ND		ug/kg	2.0	--
n-Butylbenzene	ND		ug/kg	1.0	--
sec-Butylbenzene	ND		ug/kg	1.0	--
tert-Butylbenzene	ND		ug/kg	2.0	--
o-Chlorotoluene	ND		ug/kg	2.0	--

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400193

Project Number: 289302 **Report Date:** 01/12/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 01/04/24 09:41
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1871046-5					
p-Chlorotoluene	ND		ug/kg	2.0	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	3.0	--
Hexachlorobutadiene	ND		ug/kg	4.0	--
Isopropylbenzene	ND		ug/kg	1.0	--
p-Isopropyltoluene	ND		ug/kg	1.0	--
Naphthalene	ND		ug/kg	4.0	--
n-Propylbenzene	ND		ug/kg	1.0	--
1,2,3-Trichlorobenzene	ND		ug/kg	2.0	--
1,2,4-Trichlorobenzene	ND		ug/kg	2.0	--
1,3,5-Trimethylbenzene	ND		ug/kg	2.0	--
1,2,4-Trimethylbenzene	ND		ug/kg	2.0	--
Diethyl ether	ND		ug/kg	2.0	--
Diisopropyl Ether	ND		ug/kg	2.0	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	2.0	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	2.0	--
1,4-Dioxane	ND		ug/kg	80	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	112		70-130
Toluene-d8	94		70-130
4-Bromofluorobenzene	96		70-130
Dibromofluoromethane	97		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2400193
Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1871046-3 WG1871046-4								
Methylene chloride	85		93		70-130	9		20
1,1-Dichloroethane	103		92		70-130	11		20
Chloroform	87		89		70-130	2		20
Carbon tetrachloride	87		88		70-130	1		20
1,2-Dichloropropane	97		98		70-130	1		20
Dibromochloromethane	88		97		70-130	10		20
1,1,2-Trichloroethane	90		96		70-130	6		20
Tetrachloroethene	85		86		70-130	1		20
Chlorobenzene	87		90		70-130	3		20
Trichlorofluoromethane	85		82		70-130	4		20
1,2-Dichloroethane	93		97		70-130	4		20
1,1,1-Trichloroethane	88		89		70-130	1		20
Bromodichloromethane	92		96		70-130	4		20
trans-1,3-Dichloropropene	83		91		70-130	9		20
cis-1,3-Dichloropropene	89		94		70-130	5		20
1,1-Dichloropropene	94		92		70-130	2		20
Bromoform	78		92		70-130	16		20
1,1,2,2-Tetrachloroethane	88		101		70-130	14		20
Benzene	91		90		70-130	1		20
Toluene	86		88		70-130	2		20
Ethylbenzene	90		93		70-130	3		20
Chloromethane	90		87		70-130	3		20
Bromomethane	83		79		70-130	5		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2400193
Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1871046-3 WG1871046-4								
Vinyl chloride	84		82		70-130	2		20
Chloroethane	95		92		70-130	3		20
1,1-Dichloroethene	82		82		70-130	0		20
trans-1,2-Dichloroethene	86		89		70-130	3		20
Trichloroethene	93		93		70-130	0		20
1,2-Dichlorobenzene	86		93		70-130	8		20
1,3-Dichlorobenzene	87		90		70-130	3		20
1,4-Dichlorobenzene	85		89		70-130	5		20
Methyl tert butyl ether	89		99		70-130	11		20
p/m-Xylene	90		92		70-130	2		20
o-Xylene	89		92		70-130	3		20
cis-1,2-Dichloroethene	82		83		70-130	1		20
Dibromomethane	83		88		70-130	6		20
1,2,3-Trichloropropane	86		96		70-130	11		20
Styrene	92		95		70-130	3		20
Dichlorodifluoromethane	**50**	Q	**48**	Q	70-130	4		20
Acetone	83		111		70-130	**29**	Q	20
Carbon disulfide	80		81		70-130	1		20
Methyl ethyl ketone	82		96		70-130	16		20
Methyl isobutyl ketone	86		101		70-130	16		20
2-Hexanone	91		111		70-130	20		20
Bromochloromethane	79		81		70-130	3		20
Tetrahydrofuran	83		96		70-130	15		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2400193
Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1871046-3 WG1871046-4								
2,2-Dichloropropane	76		77		70-130	1		20
1,2-Dibromoethane	88		96		70-130	9		20
1,3-Dichloropropane	90		97		70-130	7		20
1,1,1,2-Tetrachloroethane	78		85		70-130	9		20
Bromobenzene	84		88		70-130	5		20
n-Butylbenzene	99		100		70-130	1		20
sec-Butylbenzene	93		96		70-130	3		20
tert-Butylbenzene	90		93		70-130	3		20
o-Chlorotoluene	104		106		70-130	2		20
p-Chlorotoluene	92		94		70-130	2		20
1,2-Dibromo-3-chloropropane	74		90		70-130	20		20
Hexachlorobutadiene	81		82		70-130	1		20
Isopropylbenzene	92		94		70-130	2		20
p-Isopropyltoluene	93		94		70-130	1		20
Naphthalene	82		94		70-130	14		20
n-Propylbenzene	94		97		70-130	3		20
1,2,3-Trichlorobenzene	85		92		70-130	8		20
1,2,4-Trichlorobenzene	91		95		70-130	4		20
1,3,5-Trimethylbenzene	91		94		70-130	3		20
1,2,4-Trimethylbenzene	92		95		70-130	3		20
Diethyl ether	88		93		70-130	6		20
Diisopropyl Ether	**140**	Q	115		70-130	20		20
Ethyl-Tert-Butyl-Ether	96		99		70-130	3		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2400193

Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1871046-3 WG1871046-4								
Tertiary-Amyl Methyl Ether	81		87		70-130	7		20
1,4-Dioxane	75		87		70-130	15		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	104		104		70-130
Toluene-d8	96		97		70-130
4-Bromofluorobenzene	97		97		70-130
Dibromofluoromethane	94		93		70-130

SEMIVOLATILES

Project Name: LEDGE RD LANDFILL
Lab Number: L2400193
Project Number: 289302
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400193-01
Client ID: WRA-5
Sample Location: ANDOVER, MA

Date Collected: 01/02/24 13:30
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8270E
Analytical Date: 01/04/24 12:01
Analyst: LJG
Percent Solids: 87%

Extraction Method: EPA 3546
Extraction Date: 01/04/24 00:22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP PAHs - Westborough Lab						
Acenaphthene	ND		ug/kg	150	--	1
Fluoranthene	ND		ug/kg	110	--	1
Naphthalene	ND		ug/kg	190	--	1
Benzo(a)anthracene	ND		ug/kg	110	--	1
Benzo(a)pyrene	ND		ug/kg	150	--	1
Benzo(b)fluoranthene	ND		ug/kg	110	--	1
Benzo(k)fluoranthene	ND		ug/kg	110	--	1
Chrysene	ND		ug/kg	110	--	1
Acenaphthylene	ND		ug/kg	150	--	1
Anthracene	ND		ug/kg	110	--	1
Benzo(ghi)perylene	ND		ug/kg	150	--	1
Fluorene	ND		ug/kg	190	--	1
Phenanthrene	ND		ug/kg	110	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	80	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	150	--	1
Pyrene	ND		ug/kg	110	--	1
2-Methylnaphthalene	ND		ug/kg	80	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	100		30-130
2-Fluorobiphenyl	80		30-130
4-Terphenyl-d14	70		30-130

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2400193
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400193-01
Client ID: WRA-5
Sample Location: ANDOVER, MA

Date Collected: 01/02/24 13:30
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8270E-SIM
Analytical Date: 01/11/24 12:10
Analyst: AMV
Percent Solids: 87%

Extraction Method: EPA 3570
Extraction Date: 01/09/24 23:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP 1,4 Dioxane by 8270E-SIM - Mansfield Lab						
1,4-Dioxane	ND		ug/kg	8.22	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,4-Dioxane-d8	51		15-110

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2400193
Report Date: 01/12/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E
Analytical Date: 01/04/24 10:03
Analyst: LJG

Extraction Method: EPA 3546
Extraction Date: 01/04/24 00:22

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01 Batch: WG1870800-1					
Acenaphthene	ND		ug/kg	130	--
Fluoranthene	ND		ug/kg	97	--
Naphthalene	ND		ug/kg	160	--
Benzo(a)anthracene	ND		ug/kg	97	--
Benzo(a)pyrene	ND		ug/kg	130	--
Benzo(b)fluoranthene	ND		ug/kg	97	--
Benzo(k)fluoranthene	ND		ug/kg	97	--
Chrysene	ND		ug/kg	97	--
Acenaphthylene	ND		ug/kg	130	--
Anthracene	ND		ug/kg	97	--
Benzo(ghi)perylene	ND		ug/kg	130	--
Fluorene	ND		ug/kg	160	--
Phenanthrene	ND		ug/kg	97	--
Dibenzo(a,h)anthracene	ND		ug/kg	68	--
Indeno(1,2,3-cd)pyrene	ND		ug/kg	130	--
Pyrene	ND		ug/kg	97	--
2-Methylnaphthalene	ND		ug/kg	68	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	98		30-130
2-Fluorobiphenyl	77		30-130
4-Terphenyl-d14	83		30-130

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2400193
Report Date: 01/12/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E-SIM
Analytical Date: 01/11/24 10:53
Analyst: AMV

Extraction Method: EPA 3570
Extraction Date: 01/09/24 23:00

Parameter	Result	Qualifier	Units	RL	MDL
MCP 1,4 Dioxane by 8270E-SIM - Mansfield Lab for sample(s): 01 Batch: WG1872485-1					
1,4-Dioxane	ND		ug/kg	8.00	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,4-Dioxane-d8	66		15-110

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2400193

Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01 Batch: WG1870800-2 WG1870800-3								
Acenaphthene	69		70		40-140	1		30
Fluoranthene	73		72		40-140	1		30
Naphthalene	75		73		40-140	3		30
Benzo(a)anthracene	79		76		40-140	4		30
Benzo(a)pyrene	80		75		40-140	6		30
Benzo(b)fluoranthene	79		69		40-140	14		30
Benzo(k)fluoranthene	72		77		40-140	7		30
Chrysene	80		75		40-140	6		30
Acenaphthylene	70		72		40-140	3		30
Anthracene	75		72		40-140	4		30
Benzo(ghi)perylene	74		72		40-140	3		30
Fluorene	70		71		40-140	1		30
Phenanthrene	74		71		40-140	4		30
Dibenzo(a,h)anthracene	79		75		40-140	5		30
Indeno(1,2,3-cd)pyrene	78		74		40-140	5		30
Pyrene	74		73		40-140	1		30
2-Methylnaphthalene	71		72		40-140	1		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2400193

Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01 Batch: WG1870800-2 WG1870800-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Nitrobenzene-d5	94		93		30-130
2-Fluorobiphenyl	72		70		30-130
4-Terphenyl-d14	78		74		30-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2400193

Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP 1,4 Dioxane by 8270E-SIM - Mansfield Lab Associated sample(s): 01 Batch: WG1872485-2 WG1872485-3								
1,4-Dioxane	118		118		40-140	0		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,4-Dioxane-d8	62		64		15-110

PETROLEUM HYDROCARBONS

Project Name: LEDGE RD LANDFILL
Lab Number: L2400193
Project Number: 289302
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400193-01
Client ID: WRA-5
Sample Location: ANDOVER, MA

Date Collected: 01/02/24 13:30
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 1,8015D(M)
Analytical Date: 01/04/24 07:07
Analyst: CRE
Percent Solids: 87%

Extraction Method: EPA 3546
Extraction Date: 01/03/24 23:42

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C10-C36)	ND		ug/kg	37000	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	86		40-140

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2400193
Report Date: 01/12/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015D(M)
Analytical Date: 01/04/24 09:03
Analyst: CRE

Extraction Method: EPA 3546
Extraction Date: 01/03/24 03:57

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbon Quantitation - Westborough Lab for sample(s): 01 Batch: WG1870358-1					
TPH (C10-C36)	ND		ug/kg	32700	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	67		40-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2400193

Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 01 Batch: WG1870358-2								
TPH (C10-C36)	72		-		40-140	-		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
o-Terphenyl	64				40-140

PCBS

Project Name: LEDGE RD LANDFILL
Lab Number: L2400193
Project Number: 289302
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400193-01
Client ID: WRA-5
Sample Location: ANDOVER, MA

Date Collected: 01/02/24 13:30
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8082A
Analytical Date: 01/04/24 07:29
Analyst: MHG
Percent Solids: 87%

Extraction Method: EPA 3546
Extraction Date: 01/03/24 18:37
Cleanup Method: EPA 3665A
Cleanup Date: 01/04/24
Cleanup Method: EPA 3660B
Cleanup Date: 01/04/24

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	55.9	--	1	A
Aroclor 1221	ND		ug/kg	55.9	--	1	A
Aroclor 1232	ND		ug/kg	55.9	--	1	A
Aroclor 1242	ND		ug/kg	55.9	--	1	A
Aroclor 1248	ND		ug/kg	55.9	--	1	A
Aroclor 1254	ND		ug/kg	55.9	--	1	A
Aroclor 1260	ND		ug/kg	55.9	--	1	A
Aroclor 1262	ND		ug/kg	55.9	--	1	A
Aroclor 1268	ND		ug/kg	55.9	--	1	A
PCBs, Total	ND		ug/kg	55.9	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	59		30-150	A
Decachlorobiphenyl	42		30-150	A
2,4,5,6-Tetrachloro-m-xylene	59		30-150	B
Decachlorobiphenyl	43		30-150	B

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2400193
Report Date: 01/12/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082A
Analytical Date: 01/04/24 07:09
Analyst: AKM

Extraction Method: EPA 3546
Extraction Date: 01/03/24 18:37
Cleanup Method: EPA 3665A
Cleanup Date: 01/04/24
Cleanup Method: EPA 3660B
Cleanup Date: 01/04/24

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01 Batch: WG1870751-1						
Aroclor 1016	ND		ug/kg	48.9	--	A
Aroclor 1221	ND		ug/kg	48.9	--	A
Aroclor 1232	ND		ug/kg	48.9	--	A
Aroclor 1242	ND		ug/kg	48.9	--	A
Aroclor 1248	ND		ug/kg	48.9	--	A
Aroclor 1254	ND		ug/kg	48.9	--	A
Aroclor 1260	ND		ug/kg	48.9	--	A
Aroclor 1262	ND		ug/kg	48.9	--	A
Aroclor 1268	ND		ug/kg	48.9	--	A
PCBs, Total	ND		ug/kg	48.9	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	63		30-150	A
Decachlorobiphenyl	44		30-150	A
2,4,5,6-Tetrachloro-m-xylene	63		30-150	B
Decachlorobiphenyl	48		30-150	B

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2400193
Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01 Batch: WG1870751-2 WG1870751-3									
Aroclor 1016	65		66		40-140	2		30	A
Aroclor 1260	53		55		40-140	4		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	60		62		30-150	A
Decachlorobiphenyl	43		45		30-150	A
2,4,5,6-Tetrachloro-m-xylene	59		61		30-150	B
Decachlorobiphenyl	46		46		30-150	B

METALS

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400193

Project Number: 289302 **Report Date:** 01/12/24

SAMPLE RESULTS

Lab ID: L2400193-01 Date Collected: 01/02/24 13:30

Client ID: WRA-5 Date Received: 01/03/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 87%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.26	--	1	01/04/24 00:42	01/04/24 08:05	EPA 3050B	97,6010D	DMC
Arsenic, Total	11.6		mg/kg	0.452	--	1	01/04/24 00:42	01/04/24 08:05	EPA 3050B	97,6010D	DMC
Barium, Total	30.0		mg/kg	0.452	--	1	01/04/24 00:42	01/04/24 08:05	EPA 3050B	97,6010D	DMC
Beryllium, Total	0.427		mg/kg	0.226	--	1	01/04/24 00:42	01/04/24 08:05	EPA 3050B	97,6010D	DMC
Cadmium, Total	ND		mg/kg	0.452	--	1	01/04/24 00:42	01/04/24 08:05	EPA 3050B	97,6010D	DMC
Chromium, Total	21.0		mg/kg	0.452	--	1	01/04/24 00:42	01/04/24 08:05	EPA 3050B	97,6010D	DMC
Lead, Total	7.50		mg/kg	2.26	--	1	01/04/24 00:42	01/04/24 08:05	EPA 3050B	97,6010D	DMC
Mercury, Total	ND		mg/kg	0.085	--	1	01/04/24 01:06	01/04/24 08:57	EPA 7471B	97,7471B	GMG
Nickel, Total	18.0		mg/kg	1.13	--	1	01/04/24 00:42	01/04/24 08:05	EPA 3050B	97,6010D	DMC
Selenium, Total	ND		mg/kg	2.26	--	1	01/04/24 00:42	01/04/24 08:05	EPA 3050B	97,6010D	DMC
Silver, Total	ND		mg/kg	0.452	--	1	01/04/24 00:42	01/04/24 08:05	EPA 3050B	97,6010D	DMC
Thallium, Total	ND		mg/kg	2.26	--	1	01/04/24 00:42	01/04/24 08:05	EPA 3050B	97,6010D	DMC
Vanadium, Total	13.9		mg/kg	0.452	--	1	01/04/24 00:42	01/04/24 08:05	EPA 3050B	97,6010D	DMC
Zinc, Total	27.2		mg/kg	2.26	--	1	01/04/24 00:42	01/04/24 08:05	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400193

Project Number: 289302 **Report Date:** 01/12/24

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1870778-1										
Antimony, Total	ND		mg/kg	2.00	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Arsenic, Total	ND		mg/kg	0.400	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Barium, Total	ND		mg/kg	0.400	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Beryllium, Total	ND		mg/kg	0.200	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Cadmium, Total	ND		mg/kg	0.400	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Chromium, Total	ND		mg/kg	0.400	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Lead, Total	ND		mg/kg	2.00	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Nickel, Total	ND		mg/kg	1.00	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Selenium, Total	ND		mg/kg	2.00	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Silver, Total	ND		mg/kg	0.400	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Thallium, Total	ND		mg/kg	2.00	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Vanadium, Total	ND		mg/kg	0.400	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Zinc, Total	ND		mg/kg	2.00	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC

Prep Information

Digestion Method: EPA 3050B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1870779-1										
Mercury, Total	ND		mg/kg	0.083	--	1	01/04/24 01:06	01/04/24 08:47	97,7471B	GMG

Prep Information

Digestion Method: EPA 7471B

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2400193

Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1870778-2 WG1870778-3 SRM Lot Number: D122-540								
Antimony, Total	164		158		6-194	4		30
Arsenic, Total	109		104		81-119	5		30
Barium, Total	104		91		83-117	13		30
Beryllium, Total	104		101		83-117	3		30
Cadmium, Total	102		98		83-117	4		30
Chromium, Total	101		97		82-118	4		30
Lead, Total	105		101		83-117	4		30
Nickel, Total	105		101		83-117	4		30
Selenium, Total	117		113		81-119	3		30
Silver, Total	104		100		80-120	4		30
Thallium, Total	109		106		81-119	3		30
Vanadium, Total	96		92		80-120	4		30
Zinc, Total	102		99		82-119	3		30
MCP Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1870779-2 WG1870779-3 SRM Lot Number: D122-540								
Mercury, Total	102		96		73-127	6		30

INORGANICS
&
MISCELLANEOUS

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2400193
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400193-01
Client ID: WRA-5
Sample Location: ANDOVER, MA

Date Collected: 01/02/24 13:30
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	86.6		%	0.100	NA	1	-	01/04/24 07:38	121,2540G	ROI

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2400193
Report Date: 01/12/24

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2400193-01A	Vial MeOH preserved	A	NA		5.3	Y	Absent		MCP-8260HLW-21(14)
L2400193-01B	Vial water preserved	A	NA		5.3	Y	Absent	03-JAN-24 18:09	MCP-8260HLW-21(14)
L2400193-01C	Vial water preserved	A	NA		5.3	Y	Absent	03-JAN-24 18:09	MCP-8260HLW-21(14)
L2400193-01D	Plastic 120ml unpreserved	A	NA		5.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-TL-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-ZN-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L2400193-01E	Glass 60mL/2oz unpreserved	A	NA		5.3	Y	Absent		MCP-8082-10(365),TS(7),MCP-PAH-21(14),TPH-DRO-D(14)
L2400193-01F	Glass 250ml/8oz unpreserved	A	NA		5.3	Y	Absent		MCP-8082-10(365),A2-MCP-14DX-SIM-21(14),TS(7),MCP-PAH-21(14),TPH-DRO-D(14)

*Values in parentheses indicate holding time in days

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2400193
Project Number:	289302	**Report Date:**	01/12/24

GLOSSARY

Acronyms

DL - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EMPC - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LOD - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

LOQ - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

NR - No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TEF - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.

TEQ - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2400193
Project Number:	289302	**Report Date:**	01/12/24

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2400193
Project Number:	289302	**Report Date:**	01/12/24

Data Qualifiers

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: Data Usability Report

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400193

Project Number: 289302 **Report Date:** 01/12/24

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

141 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA and IIB, November 2021.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 1/3/24

ALPHA Job #: L2400193

Client Information

Client: CDM Smith
Address: 75 State Street, Suite 701
Boston, MA 02109
Phone: 617-452-6563
Fax:
Email: JonesNE@cdmsmith.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Ledge Rd Landfill
Project Location: Andover, MA
Project #: 289302
Project Manager: Nathan Jones
ALPHA Quote #:

Turn-Around Time

☐ Standard ☒ RUSH (only confirmed if pre-approved!)
Date Due: Time:

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program: MassDEP Criteria: RCS-1 Soil Standards

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

☒ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☒ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

Detection limits for each parameter shall be less than reportable concentrations for RCS-1 criteria

ANALYSIS

VOCs - EPA 8260
MCP-14 Metals - EPA 6010/7000
PAHs - EPA 8270
TPH - MassDEP Method
PCBs - EPA 8082

SAMPLE HANDLING

Filtration
☐ Done
☒ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

Sample Specific Comments

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	VOCs	MCP-14 Metals	PAHs	TPH	PCBs	Sample Specific Comments	TOTAL # BOTTLES
00193-	WRA-1-N			SO	JLW							
	WRA-1-S			SO	JLW							
	WRA-2			SO	JLW							
	WRA-3			SO	JLW							
	WRA-4			SO	JLW							
01	WRA-5	1/2/2024	13:30	SO	JLW	X	X	X	X	X		

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP *or* CT RCP?

Container Type
Preservative

Relinquished By:	Date/Time	Received By:	Date/Time
	1/3/24 1045		1/3/24 1045
	1/3/24 1526		1/3/24 1526

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 1E Jan-2010)

Method Blank Summary
Form 4
Volatiles

Client	: CDM Smith, Inc.	**Lab Number**	: L2400193
Project Name	: LEDGE RD LANDFILL	**Project Number**	: 289302
Lab Sample ID	: WG1871046-5	**Lab File ID**	: V29240104A05
Instrument ID	: VOA129		
Matrix	: SOIL	**Analysis Date**	: 01/04/24 09:41

Client Sample No.	Lab Sample ID	Analysis Date
WG1871046-3LCS	WG1871046-3	01/04/24 08:17
WG1871046-4LCSD	WG1871046-4	01/04/24 08:38
WRA-5	L2400193-01	01/04/24 11:04

Calibration Verification Summary
Form 7
Volatiles

Client	: CDM Smith, Inc.	**Lab Number**	: L2400193
Project Name	: LEDGE RD LANDFILL	**Project Number**	: 289302
Instrument ID	: VOA129	**Calibration Date**	: 01/04/24 08:17
Lab File ID	: V29240104A01	**Init. Calib. Date(s)**	: 12/19/23 12/20/23
Sample No	: WG1871046-2	**Init. Calib. Times**	: 21:48 01:16
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
Fluorobenzene	1	1	-	0	20	87	0
Dichlorodifluoromethane	0.332	0.167	-	49.7*	20	41	0
Chloromethane	0.42	0.377	-	10.2	20	74	0
Vinyl chloride	0.377	0.317	-	15.9	20	69	0
Bromomethane	0.185	0.153	-	17.3	20	76	0
Chloroethane	0.206	0.195	-	5.3	20	78	0
Trichlorofluoromethane	0.367	0.311	-	15.3	20	69	0
Ethyl ether	0.13	0.115	-	11.5	20	75	0
1,1-Dichloroethene	0.225	0.184	-	18.2	20	68	0
Carbon disulfide	0.786	0.63	-	19.8	20	66	0
Freon-113	0.237	0.201	-	15.2	20	67	0
Acrolein	40	35.033	-	12.4	20	78	0
Methylene chloride	40	34.114	-	14.7	20	71	0
Acetone	40	33.042	-	17.4	20	76	0
trans-1,2-Dichloroethene	0.255	0.218	-	14.5	20	71	0
Methyl acetate	0.254	0.217	-	14.6	20	80	0
Methyl tert-butyl ether	0.671	0.598	-	10.9	20	72	-.01
tert-Butyl alcohol	0.045	0.03	-	33.3*	20	63	-.02
Diisopropyl ether	1.023	1.43	-	-39.8*	20	112	-.01
1,1-Dichloroethane	0.563	0.579	-	-2.8	20	86	0
Halothane	0.193	0.161	-	16.6	20	69	0
Acrylonitrile	0.108	0.11	-	-1.9	20	91	0
Ethyl tert-butyl ether	0.907	0.869	-	4.2	20	76	-.01
Vinyl acetate	0.658	0.633	-	3.8	20	79	0
cis-1,2-Dichloroethene	0.289	0.236	-	18.3	20	67	0
2,2-Dichloropropane	0.35	0.265	-	24.3*	20	63	0
Bromochloromethane	0.134	0.106	-	20.9*	20	67	0
Cyclohexane	0.555	0.539	-	2.9	20	76	0
Chloroform	0.485	0.424	-	12.6	20	72	0
Ethyl acetate	0.302	0.274	-	9.3	20	76	0
Carbon tetrachloride	0.313	0.271	-	13.4	20	69	0
Tetrahydrofuran	0.112	0.093	-	17	20	74	0
Dibromofluoromethane	0.252	0.238	-	5.6	20	82	0
1,1,1-Trichloroethane	0.381	0.336	-	11.8	20	68	0
2-Butanone	0.151	0.124	-	17.9	20	73	0
1,1-Dichloropropene	0.343	0.323	-	5.8	20	73	0
Benzene	0.99	0.901	-	9	20	72	0
tert-Amyl methyl ether	0.633	0.515	-	18.6	20	65	0
1,2-Dichloroethane-d4	0.321	0.333	-	-3.7	20	92	0
1,2-Dichloroethane	0.417	0.389	-	6.7	20	77	0
Methyl cyclohexane	0.428	0.371	-	13.3	20	67	0
Trichloroethene	0.26	0.242	-	6.9	20	72	0
Dibromomethane	0.162	0.134	-	17.3	20	69	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: CDM Smith, Inc.	**Lab Number**	: L2400193
Project Name	: LEDGE RD LANDFILL	**Project Number**	: 289302
Instrument ID	: VOA129	**Calibration Date**	: 01/04/24 08:17
Lab File ID	: V29240104A01	**Init. Calib. Date(s)**	: 12/19/23 12/20/23
Sample No	: WG1871046-2	**Init. Calib. Times**	: 21:48 01:16
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
1,2-Dichloropropane	0.306	0.296	-	3.3	20	77	0
2-Chloroethyl vinyl ether	0.184	0.16	-	13	20	71	-.03
Bromodichloromethane	0.336	0.309	-	8	20	73	0
1,4-Dioxane	0.00323	0.00243*	-	24.8*	20	65	0
cis-1,3-Dichloropropene	0.366	0.326	-	10.9	20	68	0
Chlorobenzene-d5	1	1	-	0	20	88	0
Toluene-d8	1.302	1.256	-	3.5	20	85	0
Toluene	0.875	0.753	-	13.9	20	71	0
4-Methyl-2-pentanone	0.155	0.133	-	14.2	20	70	0
Tetrachloroethene	0.338	0.288	-	14.8	20	67	0
trans-1,3-Dichloropropene	0.445	0.37	-	16.9	20	67	0
Ethyl methacrylate	0.351	0.304	-	13.4	20	70	0
1,1,2-Trichloroethane	0.248	0.223	-	10.1	20	74	0
Chlorodibromomethane	0.307	0.269	-	12.4	20	69	0
1,3-Dichloropropane	0.508	0.457	-	10	20	73	0
1,2-Dibromoethane	0.274	0.241	-	12	20	70	0
2-Hexanone	0.275	0.25	-	9.1	20	75	0
Chlorobenzene	0.945	0.826	-	12.6	20	71	0
Ethylbenzene	1.663	1.502	-	9.7	20	74	0
1,1,1,2-Tetrachloroethane	40	31.36	-	21.6*	20	69	0
p/m Xylene	0.625	0.561	-	10.2	20	72	0
o Xylene	0.606	0.539	-	11.1	20	72	0
Styrene	0.997	0.919	-	7.8	20	72	0
1,4-Dichlorobenzene-d4	1	1	-	0	20	90	0
Bromoform	0.388	0.303	-	21.9*	20	65	0
Isopropylbenzene	3.156	2.888	-	8.5	20	73	0
4-Bromofluorobenzene	0.963	0.931	-	3.3	20	86	0
Bromobenzene	0.786	0.658	-	16.3	20	69	0
n-Propylbenzene	3.818	3.593	-	5.9	20	76	0
1,4-Dichlorobutane	1.245	1.214	-	2.5	20	81	0
1,1,2,2-Tetrachloroethane	0.713	0.629	-	11.8	20	70	0
4-Ethyltoluene	3.149	2.953	-	6.2	20	75	0
2-Chlorotoluene	2.37	2.474	-	-4.4	20	86	0
1,3,5-Trimethylbenzene	2.79	2.526	-	9.5	20	73	0
1,2,3-Trichloropropane	0.642	0.552	-	14	20	72	0
trans-1,4-Dichloro-2-buten	0.263	0.251	-	4.6	20	83	0
4-Chlorotoluene	2.434	2.235	-	8.2	20	75	0
tert-Butylbenzene	2.31	2.086	-	9.7	20	74	0
1,2,4-Trimethylbenzene	2.69	2.479	-	7.8	20	74	0
sec-Butylbenzene	3.438	3.194	-	7.1	20	74	0
p-Isopropyltoluene	2.933	2.728	-	7	20	75	0
1,3-Dichlorobenzene	1.526	1.324	-	13.2	20	71	0
1,4-Dichlorobenzene	1.552	1.32	-	14.9	20	71	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: CDM Smith, Inc.	**Lab Number**	: L2400193
Project Name	: LEDGE RD LANDFILL	**Project Number**	: 289302
Instrument ID	: VOA129	**Calibration Date**	: 01/04/24 08:17
Lab File ID	: V29240104A01	**Init. Calib. Date(s)**	: 12/19/23 12/20/23
Sample No	: WG1871046-2	**Init. Calib. Times**	: 21:48 01:16
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
p-Diethylbenzene	1.805	1.669	-	7.5	20	74	0
n-Butylbenzene	2.679	2.646	-	1.2	20	79	0
1,2-Dichlorobenzene	1.438	1.231	-	14.4	20	72	0
1,2,4,5-Tetramethylbenzene	2.739	2.57	-	6.2	20	75	0
1,2-Dibromo-3-chloropropan	0.115	0.085	-	26.1*	20	64	0
1,3,5-Trichlorobenzene	1.142	1.015	-	11.1	20	75	0
Hexachlorobutadiene	0.554	0.447	-	19.3	20	66	0
1,2,4-Trichlorobenzene	1.012	0.918	-	9.3	20	75	0
Naphthalene	2.453	2.018	-	17.7	20	68	0
1,2,3-Trichlorobenzene	0.973	0.829	-	14.8	20	72	0

* Value outside of QC limits.

ANALYTICAL REPORT

Lab Number:	L2400301
Client:	CDM Smith, Inc. 75 State Street Suite 701 Boston, MA 02109
ATTN:	Nathan Jones
Phone:	(617) 452-6563
Project Name:	LEDGE RD LANDFILL
Project Number:	289302
Report Date:	01/12/24

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Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2400301
Report Date: 01/12/24

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2400301-01	WRA-3	SOIL	ANDOVER, MA	01/03/24 11:00	01/03/24
L2400301-02	WRA-4	SOIL	ANDOVER, MA	01/03/24 11:50	01/03/24
L2400301-03	TRIP BLANK	SOIL	ANDOVER, MA	01/03/24 00:00	01/03/24

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400301

Project Number: 289302 **Report Date:** 01/12/24

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	NO

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2400301
Project Number:	289302	**Report Date:**	01/12/24

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400301
Project Number: 289302 **Report Date:** 01/12/24

Case Narrative (continued)

Report Submission

January 12, 2024: This final report includes the results of all requested analyses.

January 05, 2024: This is a preliminary report.

MCP Related Narratives

Sample Receipt

L2400301-03: A sample identified as "TRIP BLANK" was received, but not listed on the Chain of Custody. This sample was not analyzed.

In reference to question H:

A Matrix Spike was not submitted for the analysis of Total Metals.

Volatile Organics

L2400301-01 and -02: Initial calibration utilized a quadratic fit for: 1,1,1,2-tetrachloroethane

In reference to question H:

L2400301-01 and -02: Initial Calibration did not meet:

Lowest Calibration Standard Minimum Response Factor: trichloroethene (0.1904), bromodichloromethane (0.2472), 1,4-dioxane (0.0032), cis-1,3-dichloropropene (0.2490)

Average Response Factor: 1,4-dioxane

Verification: dichlorodifluoromethane (62%)

L2400301-01 and -02: The associated continuing calibration standard is outside the acceptance criteria for several compounds; however, it is within overall method allowances. Associated results are considered to be biased high if the %D is negative and biased low if the %D is positive. A copy of the continuing calibration standard is included as an addendum to this report.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2400301
Project Number:	289302	**Report Date:**	01/12/24

Case Narrative (continued)

PAHs

In reference to question I:

All samples were analyzed for a subset of MCP analytes per client request.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Cristin Walker

Title: Technical Director/Representative Date: 01/12/24

QC OUTLIER SUMMARY REPORT

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2400301
Report Date: 01/12/24

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment
MCP Volatile Organics by EPA 5035 Low - Westborough Lab								
8260D	Batch QC	WG1871046-3	Dichlorodifluoromethane	LCS	50	70-130	01-02	potential low bias
8260D	Batch QC	WG1871046-3	Diisopropyl Ether	LCS	140	70-130	01-02	potential high bias
8260D	Batch QC	WG1871046-4	Dichlorodifluoromethane	LCSD	48	70-130	01-02	potential low bias
8260D	Batch QC	WG1871046-4	Acetone	LCSD	29	20	01-02	non-directional bias

ORGANICS

VOLATILES

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400301

Project Number: 289302 **Report Date:** 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-01 Date Collected: 01/03/24 11:00
Client ID: WRA-3 Date Received: 01/03/24
Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8260D
Analytical Date: 01/04/24 11:25
Analyst: AJK
Percent Solids: 85%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Methylene chloride	ND		ug/kg	9.5	--	1
1,1-Dichloroethane	ND		ug/kg	1.9	--	1
Chloroform	ND		ug/kg	2.8	--	1
Carbon tetrachloride	ND		ug/kg	1.9	--	1
1,2-Dichloropropane	ND		ug/kg	1.9	--	1
Dibromochloromethane	ND		ug/kg	1.9	--	1
1,1,2-Trichloroethane	ND		ug/kg	1.9	--	1
Tetrachloroethene	ND		ug/kg	0.95	--	1
Chlorobenzene	ND		ug/kg	0.95	--	1
Trichlorofluoromethane	ND		ug/kg	7.6	--	1
1,2-Dichloroethane	ND		ug/kg	1.9	--	1
1,1,1-Trichloroethane	ND		ug/kg	0.95	--	1
Bromodichloromethane	ND		ug/kg	0.95	--	1
trans-1,3-Dichloropropene	ND		ug/kg	1.9	--	1
cis-1,3-Dichloropropene	ND		ug/kg	0.95	--	1
1,3-Dichloropropene, Total	ND		ug/kg	0.95	--	1
1,1-Dichloropropene	ND		ug/kg	0.95	--	1
Bromoform	ND		ug/kg	7.6	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.95	--	1
Benzene	ND		ug/kg	0.95	--	1
Toluene	ND		ug/kg	1.9	--	1
Ethylbenzene	ND		ug/kg	1.9	--	1
Chloromethane	ND		ug/kg	7.6	--	1
Bromomethane	ND		ug/kg	3.8	--	1
Vinyl chloride	ND		ug/kg	1.9	--	1
Chloroethane	ND		ug/kg	3.8	--	1
1,1-Dichloroethene	ND		ug/kg	1.9	--	1
trans-1,2-Dichloroethene	ND		ug/kg	2.8	--	1

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400301

Project Number: 289302 **Report Date:** 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-01 Date Collected: 01/03/24 11:00

Client ID: WRA-3 Date Received: 01/03/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Trichloroethene	ND		ug/kg	0.95	--	1
1,2-Dichlorobenzene	ND		ug/kg	3.8	--	1
1,3-Dichlorobenzene	ND		ug/kg	3.8	--	1
1,4-Dichlorobenzene	ND		ug/kg	3.8	--	1
Methyl tert butyl ether	ND		ug/kg	3.8	--	1
p/m-Xylene	ND		ug/kg	3.8	--	1
o-Xylene	ND		ug/kg	1.9	--	1
Xylenes, Total	ND		ug/kg	1.9	--	1
cis-1,2-Dichloroethene	ND		ug/kg	1.9	--	1
1,2-Dichloroethene, Total	ND		ug/kg	1.9	--	1
Dibromomethane	ND		ug/kg	3.8	--	1
1,2,3-Trichloropropane	ND		ug/kg	3.8	--	1
Styrene	ND		ug/kg	1.9	--	1
Dichlorodifluoromethane	ND		ug/kg	19	--	1
Acetone	ND		ug/kg	47	--	1
Carbon disulfide	ND		ug/kg	19	--	1
Methyl ethyl ketone	ND		ug/kg	19	--	1
Methyl isobutyl ketone	ND		ug/kg	19	--	1
2-Hexanone	ND		ug/kg	19	--	1
Bromochloromethane	ND		ug/kg	3.8	--	1
Tetrahydrofuran	ND		ug/kg	7.6	--	1
2,2-Dichloropropane	ND		ug/kg	3.8	--	1
1,2-Dibromoethane	ND		ug/kg	1.9	--	1
1,3-Dichloropropane	ND		ug/kg	3.8	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	0.95	--	1
Bromobenzene	ND		ug/kg	3.8	--	1
n-Butylbenzene	ND		ug/kg	1.9	--	1
sec-Butylbenzene	ND		ug/kg	1.9	--	1
tert-Butylbenzene	ND		ug/kg	3.8	--	1
o-Chlorotoluene	ND		ug/kg	3.8	--	1
p-Chlorotoluene	ND		ug/kg	3.8	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	5.7	--	1
Hexachlorobutadiene	ND		ug/kg	7.6	--	1
Isopropylbenzene	ND		ug/kg	1.9	--	1
p-Isopropyltoluene	ND		ug/kg	1.9	--	1
Naphthalene	ND		ug/kg	7.6	--	1
n-Propylbenzene	ND		ug/kg	1.9	--	1

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400301

Project Number: 289302 **Report Date:** 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-01 Date Collected: 01/03/24 11:00

Client ID: WRA-3 Date Received: 01/03/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	3.8	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	3.8	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	3.8	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	3.8	--	1
Diethyl ether	ND		ug/kg	3.8	--	1
Diisopropyl Ether	ND		ug/kg	3.8	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	3.8	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	3.8	--	1
1,4-Dioxane	ND		ug/kg	150	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	116		70-130
Toluene-d8	93		70-130
4-Bromofluorobenzene	98		70-130
Dibromofluoromethane	103		70-130

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400301

Project Number: 289302 **Report Date:** 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-02 Date Collected: 01/03/24 11:50
Client ID: WRA-4 Date Received: 01/03/24
Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8260D
Analytical Date: 01/04/24 11:46
Analyst: AJK
Percent Solids: 73%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Methylene chloride	ND		ug/kg	18	--	1
1,1-Dichloroethane	ND		ug/kg	3.7	--	1
Chloroform	ND		ug/kg	5.5	--	1
Carbon tetrachloride	ND		ug/kg	3.7	--	1
1,2-Dichloropropane	ND		ug/kg	3.7	--	1
Dibromochloromethane	ND		ug/kg	3.7	--	1
1,1,2-Trichloroethane	ND		ug/kg	3.7	--	1
Tetrachloroethene	ND		ug/kg	1.8	--	1
Chlorobenzene	190		ug/kg	1.8	--	1
Trichlorofluoromethane	ND		ug/kg	15	--	1
1,2-Dichloroethane	ND		ug/kg	3.7	--	1
1,1,1-Trichloroethane	ND		ug/kg	1.8	--	1
Bromodichloromethane	ND		ug/kg	1.8	--	1
trans-1,3-Dichloropropene	ND		ug/kg	3.7	--	1
cis-1,3-Dichloropropene	ND		ug/kg	1.8	--	1
1,3-Dichloropropene, Total	ND		ug/kg	1.8	--	1
1,1-Dichloropropene	ND		ug/kg	1.8	--	1
Bromoform	ND		ug/kg	15	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.8	--	1
Benzene	4.4		ug/kg	1.8	--	1
Toluene	ND		ug/kg	3.7	--	1
Ethylbenzene	ND		ug/kg	3.7	--	1
Chloromethane	ND		ug/kg	15	--	1
Bromomethane	ND		ug/kg	7.4	--	1
Vinyl chloride	ND		ug/kg	3.7	--	1
Chloroethane	ND		ug/kg	7.4	--	1
1,1-Dichloroethene	ND		ug/kg	3.7	--	1
trans-1,2-Dichloroethene	ND		ug/kg	5.5	--	1

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400301

Project Number: 289302 **Report Date:** 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-02 Date Collected: 01/03/24 11:50

Client ID: WRA-4 Date Received: 01/03/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Trichloroethene	ND		ug/kg	1.8	--	1
1,2-Dichlorobenzene	19		ug/kg	7.4	--	1
1,3-Dichlorobenzene	ND		ug/kg	7.4	--	1
1,4-Dichlorobenzene	40		ug/kg	7.4	--	1
Methyl tert butyl ether	ND		ug/kg	7.4	--	1
p/m-Xylene	11		ug/kg	7.4	--	1
o-Xylene	ND		ug/kg	3.7	--	1
Xylenes, Total	11		ug/kg	3.7	--	1
cis-1,2-Dichloroethene	ND		ug/kg	3.7	--	1
1,2-Dichloroethene, Total	ND		ug/kg	3.7	--	1
Dibromomethane	ND		ug/kg	7.4	--	1
1,2,3-Trichloropropane	ND		ug/kg	7.4	--	1
Styrene	ND		ug/kg	3.7	--	1
Dichlorodifluoromethane	ND		ug/kg	37	--	1
Acetone	ND		ug/kg	92	--	1
Carbon disulfide	ND		ug/kg	37	--	1
Methyl ethyl ketone	ND		ug/kg	37	--	1
Methyl isobutyl ketone	ND		ug/kg	37	--	1
2-Hexanone	ND		ug/kg	37	--	1
Bromochloromethane	ND		ug/kg	7.4	--	1
Tetrahydrofuran	ND		ug/kg	15	--	1
2,2-Dichloropropane	ND		ug/kg	7.4	--	1
1,2-Dibromoethane	ND		ug/kg	3.7	--	1
1,3-Dichloropropane	ND		ug/kg	7.4	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.8	--	1
Bromobenzene	ND		ug/kg	7.4	--	1
n-Butylbenzene	ND		ug/kg	3.7	--	1
sec-Butylbenzene	ND		ug/kg	3.7	--	1
tert-Butylbenzene	ND		ug/kg	7.4	--	1
o-Chlorotoluene	ND		ug/kg	7.4	--	1
p-Chlorotoluene	ND		ug/kg	7.4	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	11	--	1
Hexachlorobutadiene	ND		ug/kg	15	--	1
Isopropylbenzene	11		ug/kg	3.7	--	1
p-Isopropyltoluene	ND		ug/kg	3.7	--	1
Naphthalene	ND		ug/kg	15	--	1
n-Propylbenzene	ND		ug/kg	3.7	--	1

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400301

Project Number: 289302 **Report Date:** 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-02 Date Collected: 01/03/24 11:50

Client ID: WRA-4 Date Received: 01/03/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	7.4	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	7.4	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	7.4	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	7.4	--	1
Diethyl ether	ND		ug/kg	7.4	--	1
Diisopropyl Ether	ND		ug/kg	7.4	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	7.4	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	7.4	--	1
1,4-Dioxane	ND		ug/kg	290	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	112		70-130
Toluene-d8	96		70-130
4-Bromofluorobenzene	98		70-130
Dibromofluoromethane	98		70-130

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400301

Project Number: 289302 **Report Date:** 01/12/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 01/04/24 09:41
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01-02 Batch: WG1871046-5					
Methylene chloride	ND		ug/kg	5.0	--
1,1-Dichloroethane	ND		ug/kg	1.0	--
Chloroform	ND		ug/kg	1.5	--
Carbon tetrachloride	ND		ug/kg	1.0	--
1,2-Dichloropropane	ND		ug/kg	1.0	--
Dibromochloromethane	ND		ug/kg	1.0	--
1,1,2-Trichloroethane	ND		ug/kg	1.0	--
Tetrachloroethene	ND		ug/kg	0.50	--
Chlorobenzene	ND		ug/kg	0.50	--
Trichlorofluoromethane	ND		ug/kg	4.0	--
1,2-Dichloroethane	ND		ug/kg	1.0	--
1,1,1-Trichloroethane	ND		ug/kg	0.50	--
Bromodichloromethane	ND		ug/kg	0.50	--
trans-1,3-Dichloropropene	ND		ug/kg	1.0	--
cis-1,3-Dichloropropene	ND		ug/kg	0.50	--
1,3-Dichloropropene, Total	ND		ug/kg	0.50	--
1,1-Dichloropropene	ND		ug/kg	0.50	--
Bromoform	ND		ug/kg	4.0	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.50	--
Benzene	ND		ug/kg	0.50	--
Toluene	ND		ug/kg	1.0	--
Ethylbenzene	ND		ug/kg	1.0	--
Chloromethane	ND		ug/kg	4.0	--
Bromomethane	ND		ug/kg	2.0	--
Vinyl chloride	ND		ug/kg	1.0	--
Chloroethane	ND		ug/kg	2.0	--
1,1-Dichloroethene	ND		ug/kg	1.0	--
trans-1,2-Dichloroethene	ND		ug/kg	1.5	--
Trichloroethene	ND		ug/kg	0.50	--

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400301

Project Number: 289302 **Report Date:** 01/12/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 01/04/24 09:41
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01-02 Batch: WG1871046-5					
1,2-Dichlorobenzene	ND		ug/kg	2.0	--
1,3-Dichlorobenzene	ND		ug/kg	2.0	--
1,4-Dichlorobenzene	ND		ug/kg	2.0	--
Methyl tert butyl ether	ND		ug/kg	2.0	--
p/m-Xylene	ND		ug/kg	2.0	--
o-Xylene	ND		ug/kg	1.0	--
Xylenes, Total	ND		ug/kg	1.0	--
cis-1,2-Dichloroethene	ND		ug/kg	1.0	--
1,2-Dichloroethene, Total	ND		ug/kg	1.0	--
Dibromomethane	ND		ug/kg	2.0	--
1,2,3-Trichloropropane	ND		ug/kg	2.0	--
Styrene	ND		ug/kg	1.0	--
Dichlorodifluoromethane	ND		ug/kg	10	--
Acetone	ND		ug/kg	25	--
Carbon disulfide	ND		ug/kg	10	--
Methyl ethyl ketone	ND		ug/kg	10	--
Methyl isobutyl ketone	ND		ug/kg	10	--
2-Hexanone	ND		ug/kg	10	--
Bromochloromethane	ND		ug/kg	2.0	--
Tetrahydrofuran	ND		ug/kg	4.0	--
2,2-Dichloropropane	ND		ug/kg	2.0	--
1,2-Dibromoethane	ND		ug/kg	1.0	--
1,3-Dichloropropane	ND		ug/kg	2.0	--
1,1,1,2-Tetrachloroethane	ND		ug/kg	0.50	--
Bromobenzene	ND		ug/kg	2.0	--
n-Butylbenzene	ND		ug/kg	1.0	--
sec-Butylbenzene	ND		ug/kg	1.0	--
tert-Butylbenzene	ND		ug/kg	2.0	--
o-Chlorotoluene	ND		ug/kg	2.0	--

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400301

Project Number: 289302 **Report Date:** 01/12/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 01/04/24 09:41
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01-02 Batch: WG1871046-5					
p-Chlorotoluene	ND		ug/kg	2.0	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	3.0	--
Hexachlorobutadiene	ND		ug/kg	4.0	--
Isopropylbenzene	ND		ug/kg	1.0	--
p-Isopropyltoluene	ND		ug/kg	1.0	--
Naphthalene	ND		ug/kg	4.0	--
n-Propylbenzene	ND		ug/kg	1.0	--
1,2,3-Trichlorobenzene	ND		ug/kg	2.0	--
1,2,4-Trichlorobenzene	ND		ug/kg	2.0	--
1,3,5-Trimethylbenzene	ND		ug/kg	2.0	--
1,2,4-Trimethylbenzene	ND		ug/kg	2.0	--
Diethyl ether	ND		ug/kg	2.0	--
Diisopropyl Ether	ND		ug/kg	2.0	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	2.0	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	2.0	--
1,4-Dioxane	ND		ug/kg	80	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	112		70-130
Toluene-d8	94		70-130
4-Bromofluorobenzene	96		70-130
Dibromofluoromethane	97		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2400301
Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01-02 Batch: WG1871046-3 WG1871046-4								
Methylene chloride	85		93		70-130	9		20
1,1-Dichloroethane	103		92		70-130	11		20
Chloroform	87		89		70-130	2		20
Carbon tetrachloride	87		88		70-130	1		20
1,2-Dichloropropane	97		98		70-130	1		20
Dibromochloromethane	88		97		70-130	10		20
1,1,2-Trichloroethane	90		96		70-130	6		20
Tetrachloroethene	85		86		70-130	1		20
Chlorobenzene	87		90		70-130	3		20
Trichlorofluoromethane	85		82		70-130	4		20
1,2-Dichloroethane	93		97		70-130	4		20
1,1,1-Trichloroethane	88		89		70-130	1		20
Bromodichloromethane	92		96		70-130	4		20
trans-1,3-Dichloropropene	83		91		70-130	9		20
cis-1,3-Dichloropropene	89		94		70-130	5		20
1,1-Dichloropropene	94		92		70-130	2		20
Bromoform	78		92		70-130	16		20
1,1,2,2-Tetrachloroethane	88		101		70-130	14		20
Benzene	91		90		70-130	1		20
Toluene	86		88		70-130	2		20
Ethylbenzene	90		93		70-130	3		20
Chloromethane	90		87		70-130	3		20
Bromomethane	83		79		70-130	5		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2400301
Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab	Associated sample(s): 01-02		Batch: WG1871046-3 WG1871046-4					
Vinyl chloride	84		82		70-130	2		20
Chloroethane	95		92		70-130	3		20
1,1-Dichloroethene	82		82		70-130	0		20
trans-1,2-Dichloroethene	86		89		70-130	3		20
Trichloroethene	93		93		70-130	0		20
1,2-Dichlorobenzene	86		93		70-130	8		20
1,3-Dichlorobenzene	87		90		70-130	3		20
1,4-Dichlorobenzene	85		89		70-130	5		20
Methyl tert butyl ether	89		99		70-130	11		20
p/m-Xylene	90		92		70-130	2		20
o-Xylene	89		92		70-130	3		20
cis-1,2-Dichloroethene	82		83		70-130	1		20
Dibromomethane	83		88		70-130	6		20
1,2,3-Trichloropropane	86		96		70-130	11		20
Styrene	92		95		70-130	3		20
Dichlorodifluoromethane	**50**	Q	**48**	Q	70-130	4		20
Acetone	83		111		70-130	**29**	Q	20
Carbon disulfide	80		81		70-130	1		20
Methyl ethyl ketone	82		96		70-130	16		20
Methyl isobutyl ketone	86		101		70-130	16		20
2-Hexanone	91		111		70-130	20		20
Bromochloromethane	79		81		70-130	3		20
Tetrahydrofuran	83		96		70-130	15		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2400301
Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab	Associated sample(s): 01-02		Batch: WG1871046-3 WG1871046-4					
2,2-Dichloropropane	76		77		70-130	1		20
1,2-Dibromoethane	88		96		70-130	9		20
1,3-Dichloropropane	90		97		70-130	7		20
1,1,1,2-Tetrachloroethane	78		85		70-130	9		20
Bromobenzene	84		88		70-130	5		20
n-Butylbenzene	99		100		70-130	1		20
sec-Butylbenzene	93		96		70-130	3		20
tert-Butylbenzene	90		93		70-130	3		20
o-Chlorotoluene	104		106		70-130	2		20
p-Chlorotoluene	92		94		70-130	2		20
1,2-Dibromo-3-chloropropane	74		90		70-130	20		20
Hexachlorobutadiene	81		82		70-130	1		20
Isopropylbenzene	92		94		70-130	2		20
p-Isopropyltoluene	93		94		70-130	1		20
Naphthalene	82		94		70-130	14		20
n-Propylbenzene	94		97		70-130	3		20
1,2,3-Trichlorobenzene	85		92		70-130	8		20
1,2,4-Trichlorobenzene	91		95		70-130	4		20
1,3,5-Trimethylbenzene	91		94		70-130	3		20
1,2,4-Trimethylbenzene	92		95		70-130	3		20
Diethyl ether	88		93		70-130	6		20
Diisopropyl Ether	**140**	Q	115		70-130	20		20
Ethyl-Tert-Butyl-Ether	96		99		70-130	3		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2400301

Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab	Associated sample(s): 01-02		Batch: WG1871046-3 WG1871046-4					
Tertiary-Amyl Methyl Ether	81		87		70-130	7		20
1,4-Dioxane	75		87		70-130	15		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	104		104		70-130
Toluene-d8	96		97		70-130
4-Bromofluorobenzene	97		97		70-130
Dibromofluoromethane	94		93		70-130

SEMIVOLATILES

Project Name: LEDGE RD LANDFILL
Lab Number: L2400301
Project Number: 289302
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-01
Client ID: WRA-3
Sample Location: ANDOVER, MA

Date Collected: 01/03/24 11:00
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8270E
Analytical Date: 01/04/24 12:24
Analyst: LJG
Percent Solids: 85%

Extraction Method: EPA 3546
Extraction Date: 01/04/24 00:25

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP PAHs - Westborough Lab						
Acenaphthene	ND		ug/kg	150	--	1
Fluoranthene	ND		ug/kg	120	--	1
Naphthalene	ND		ug/kg	190	--	1
Benzo(a)anthracene	ND		ug/kg	120	--	1
Benzo(a)pyrene	ND		ug/kg	150	--	1
Benzo(b)fluoranthene	ND		ug/kg	120	--	1
Benzo(k)fluoranthene	ND		ug/kg	120	--	1
Chrysene	ND		ug/kg	120	--	1
Acenaphthylene	ND		ug/kg	150	--	1
Anthracene	ND		ug/kg	120	--	1
Benzo(ghi)perylene	ND		ug/kg	150	--	1
Fluorene	ND		ug/kg	190	--	1
Phenanthrene	ND		ug/kg	120	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	81	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	150	--	1
Pyrene	ND		ug/kg	120	--	1
2-Methylnaphthalene	ND		ug/kg	81	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	105		30-130
2-Fluorobiphenyl	74		30-130
4-Terphenyl-d14	70		30-130

Project Name: LEDGE RD LANDFILL
Lab Number: L2400301
Project Number: 289302
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-02
Client ID: WRA-4
Sample Location: ANDOVER, MA

Date Collected: 01/03/24 11:50
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8270E
Analytical Date: 01/04/24 12:48
Analyst: LJG
Percent Solids: 73%

Extraction Method: EPA 3546
Extraction Date: 01/04/24 00:22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP PAHs - Westborough Lab						
Acenaphthene	ND		ug/kg	180	--	1
Fluoranthene	510		ug/kg	130	--	1
Naphthalene	ND		ug/kg	220	--	1
Benzo(a)anthracene	340		ug/kg	130	--	1
Benzo(a)pyrene	340		ug/kg	180	--	1
Benzo(b)fluoranthene	360		ug/kg	130	--	1
Benzo(k)fluoranthene	130		ug/kg	130	--	1
Chrysene	420		ug/kg	130	--	1
Acenaphthylene	180		ug/kg	180	--	1
Anthracene	ND		ug/kg	130	--	1
Benzo(ghi)perylene	200		ug/kg	180	--	1
Fluorene	ND		ug/kg	220	--	1
Phenanthrene	260		ug/kg	130	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	94	--	1
Indeno(1,2,3-cd)pyrene	210		ug/kg	180	--	1
Pyrene	640		ug/kg	130	--	1
2-Methylnaphthalene	ND		ug/kg	94	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	101		30-130
2-Fluorobiphenyl	67		30-130
4-Terphenyl-d14	50		30-130

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2400301
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-02
Client ID: WRA-4
Sample Location: ANDOVER, MA

Date Collected: 01/03/24 11:50
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8270E-SIM
Analytical Date: 01/11/24 12:36
Analyst: AMV
Percent Solids: 73%

Extraction Method: EPA 3570
Extraction Date: 01/09/24 23:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP 1,4 Dioxane by 8270E-SIM - Mansfield Lab						
1,4-Dioxane	ND		ug/kg	10.4	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,4-Dioxane-d8	55		15-110

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2400301
Report Date: 01/12/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E
Analytical Date: 01/04/24 10:03
Analyst: LJG

Extraction Method: EPA 3546
Extraction Date: 01/04/24 00:22

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-02 Batch: WG1870800-1					
Acenaphthene	ND		ug/kg	130	--
Fluoranthene	ND		ug/kg	97	--
Naphthalene	ND		ug/kg	160	--
Benzo(a)anthracene	ND		ug/kg	97	--
Benzo(a)pyrene	ND		ug/kg	130	--
Benzo(b)fluoranthene	ND		ug/kg	97	--
Benzo(k)fluoranthene	ND		ug/kg	97	--
Chrysene	ND		ug/kg	97	--
Acenaphthylene	ND		ug/kg	130	--
Anthracene	ND		ug/kg	97	--
Benzo(ghi)perylene	ND		ug/kg	130	--
Fluorene	ND		ug/kg	160	--
Phenanthrene	ND		ug/kg	97	--
Dibenzo(a,h)anthracene	ND		ug/kg	68	--
Indeno(1,2,3-cd)pyrene	ND		ug/kg	130	--
Pyrene	ND		ug/kg	97	--
2-Methylnaphthalene	ND		ug/kg	68	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	98		30-130
2-Fluorobiphenyl	77		30-130
4-Terphenyl-d14	83		30-130

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2400301
Report Date: 01/12/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E-SIM
Analytical Date: 01/11/24 10:53
Analyst: AMV

Extraction Method: EPA 3570
Extraction Date: 01/09/24 23:00

Parameter	Result	Qualifier	Units	RL	MDL
MCP 1,4 Dioxane by 8270E-SIM - Mansfield Lab for sample(s): 02 Batch: WG1872485-1					
1,4-Dioxane	ND		ug/kg	8.00	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,4-Dioxane-d8	66		15-110

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2400301
Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG1870800-2 WG1870800-3								
Acenaphthene	69		70		40-140	1		30
Fluoranthene	73		72		40-140	1		30
Naphthalene	75		73		40-140	3		30
Benzo(a)anthracene	79		76		40-140	4		30
Benzo(a)pyrene	80		75		40-140	6		30
Benzo(b)fluoranthene	79		69		40-140	14		30
Benzo(k)fluoranthene	72		77		40-140	7		30
Chrysene	80		75		40-140	6		30
Acenaphthylene	70		72		40-140	3		30
Anthracene	75		72		40-140	4		30
Benzo(ghi)perylene	74		72		40-140	3		30
Fluorene	70		71		40-140	1		30
Phenanthrene	74		71		40-140	4		30
Dibenzo(a,h)anthracene	79		75		40-140	5		30
Indeno(1,2,3-cd)pyrene	78		74		40-140	5		30
Pyrene	74		73		40-140	1		30
2-Methylnaphthalene	71		72		40-140	1		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2400301
Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG1870800-2 WG1870800-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Nitrobenzene-d5	94		93		30-130
2-Fluorobiphenyl	72		70		30-130
4-Terphenyl-d14	78		74		30-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2400301

Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP 1,4 Dioxane by 8270E-SIM - Mansfield Lab	Associated sample(s): 02		Batch: WG1872485-2		WG1872485-3			
1,4-Dioxane	118		118		40-140	0		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,4-Dioxane-d8	62		64		15-110

PETROLEUM HYDROCARBONS

Project Name: LEDGE RD LANDFILL
Lab Number: L2400301
Project Number: 289302
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-01
Client ID: WRA-3
Sample Location: ANDOVER, MA

Date Collected: 01/03/24 11:00
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 1,8015D(M)
Analytical Date: 01/04/24 07:32
Analyst: CRE
Percent Solids: 85%

Extraction Method: EPA 3546
Extraction Date: 01/03/24 23:42

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C10-C36)	ND		ug/kg	37100	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	90		40-140

Project Name: LEDGE RD LANDFILL
Lab Number: L2400301
Project Number: 289302
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-02
Client ID: WRA-4
Sample Location: ANDOVER, MA

Date Collected: 01/03/24 11:50
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 1,8015D(M)
Analytical Date: 01/04/24 08:21
Analyst: CRE
Percent Solids: 73%

Extraction Method: EPA 3546
Extraction Date: 01/03/24 23:42

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C10-C36)	120000		ug/kg	42800	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	79		40-140

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2400301
Report Date: 01/12/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015D(M)
Analytical Date: 01/04/24 09:03
Analyst: CRE

Extraction Method: EPA 3546
Extraction Date: 01/03/24 03:57

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbon Quantitation - Westborough Lab for sample(s): 01-02 Batch: WG1870358-1					
TPH (C10-C36)	ND		ug/kg	32700	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	67		40-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2400301

Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 01-02 Batch: WG1870358-2								
TPH (C10-C36)	72		-		40-140	-		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
o-Terphenyl	64				40-140

PCBS

Project Name: LEDGE RD LANDFILL
Lab Number: L2400301
Project Number: 289302
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-01
Client ID: WRA-3
Sample Location: ANDOVER, MA

Date Collected: 01/03/24 11:00
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8082A
Analytical Date: 01/04/24 07:43
Analyst: MHG
Percent Solids: 85%

Extraction Method: EPA 3546
Extraction Date: 01/03/24 23:45
Cleanup Method: EPA 3665A
Cleanup Date: 01/04/24
Cleanup Method: EPA 3660B
Cleanup Date: 01/04/24

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	56.8	--	1	A
Aroclor 1221	ND		ug/kg	56.8	--	1	A
Aroclor 1232	ND		ug/kg	56.8	--	1	A
Aroclor 1242	ND		ug/kg	56.8	--	1	A
Aroclor 1248	ND		ug/kg	56.8	--	1	A
Aroclor 1254	ND		ug/kg	56.8	--	1	A
Aroclor 1260	ND		ug/kg	56.8	--	1	A
Aroclor 1262	ND		ug/kg	56.8	--	1	A
Aroclor 1268	ND		ug/kg	56.8	--	1	A
PCBs, Total	ND		ug/kg	56.8	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	64		30-150	A
Decachlorobiphenyl	47		30-150	A
2,4,5,6-Tetrachloro-m-xylene	66		30-150	B
Decachlorobiphenyl	49		30-150	B

Project Name: LEDGE RD LANDFILL
Lab Number: L2400301
Project Number: 289302
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-02
Client ID: WRA-4
Sample Location: ANDOVER, MA

Date Collected: 01/03/24 11:50
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8082A
Analytical Date: 01/04/24 07:50
Analyst: MHG
Percent Solids: 73%

Extraction Method: EPA 3546
Extraction Date: 01/03/24 23:45
Cleanup Method: EPA 3665A
Cleanup Date: 01/04/24
Cleanup Method: EPA 3660B
Cleanup Date: 01/04/24

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	62.4	--	1	A
Aroclor 1221	ND		ug/kg	62.4	--	1	A
Aroclor 1232	ND		ug/kg	62.4	--	1	A
Aroclor 1242	154		ug/kg	62.4	--	1	A
Aroclor 1248	ND		ug/kg	62.4	--	1	A
Aroclor 1254	ND		ug/kg	62.4	--	1	B
Aroclor 1260	ND		ug/kg	62.4	--	1	A
Aroclor 1262	ND		ug/kg	62.4	--	1	A
Aroclor 1268	ND		ug/kg	62.4	--	1	A
PCBs, Total	154		ug/kg	62.4	--	1	B

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	63		30-150	A
Decachlorobiphenyl	49		30-150	A
2,4,5,6-Tetrachloro-m-xylene	62		30-150	B
Decachlorobiphenyl	51		30-150	B

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2400301
Report Date: 01/12/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082A
Analytical Date: 01/04/24 07:09
Analyst: AKM

Extraction Method: EPA 3546
Extraction Date: 01/03/24 18:37
Cleanup Method: EPA 3665A
Cleanup Date: 01/04/24
Cleanup Method: EPA 3660B
Cleanup Date: 01/04/24

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01-02 Batch: WG1870751-1						
Aroclor 1016	ND		ug/kg	48.9	--	A
Aroclor 1221	ND		ug/kg	48.9	--	A
Aroclor 1232	ND		ug/kg	48.9	--	A
Aroclor 1242	ND		ug/kg	48.9	--	A
Aroclor 1248	ND		ug/kg	48.9	--	A
Aroclor 1254	ND		ug/kg	48.9	--	A
Aroclor 1260	ND		ug/kg	48.9	--	A
Aroclor 1262	ND		ug/kg	48.9	--	A
Aroclor 1268	ND		ug/kg	48.9	--	A
PCBs, Total	ND		ug/kg	48.9	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	63		30-150	A
Decachlorobiphenyl	44		30-150	A
2,4,5,6-Tetrachloro-m-xylene	63		30-150	B
Decachlorobiphenyl	48		30-150	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2400301

Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01-02 Batch: WG1870751-2 WG1870751-3									
Aroclor 1016	65		66		40-140	2		30	A
Aroclor 1260	53		55		40-140	4		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	60		62		30-150	A
Decachlorobiphenyl	43		45		30-150	A
2,4,5,6-Tetrachloro-m-xylene	59		61		30-150	B
Decachlorobiphenyl	46		46		30-150	B

METALS

Project Name: LEDGE RD LANDFILL
Lab Number: L2400301
Project Number: 289302
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-01
Client ID: WRA-3
Sample Location: ANDOVER, MA
Date Collected: 01/03/24 11:00
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 85%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.34	--	1	01/04/24 00:42	01/04/24 09:20	EPA 3050B	97,6010D	DMC
Arsenic, Total	10.9		mg/kg	0.467	--	1	01/04/24 00:42	01/04/24 09:20	EPA 3050B	97,6010D	DMC
Barium, Total	16.1		mg/kg	0.467	--	1	01/04/24 00:42	01/04/24 09:20	EPA 3050B	97,6010D	DMC
Beryllium, Total	0.457		mg/kg	0.234	--	1	01/04/24 00:42	01/04/24 09:20	EPA 3050B	97,6010D	DMC
Cadmium, Total	ND		mg/kg	0.467	--	1	01/04/24 00:42	01/04/24 09:20	EPA 3050B	97,6010D	DMC
Chromium, Total	23.9		mg/kg	0.467	--	1	01/04/24 00:42	01/04/24 09:20	EPA 3050B	97,6010D	DMC
Lead, Total	8.48		mg/kg	2.34	--	1	01/04/24 00:42	01/04/24 09:20	EPA 3050B	97,6010D	DMC
Mercury, Total	ND		mg/kg	0.085	--	1	01/04/24 01:06	01/04/24 09:10	EPA 7471B	97,7471B	GMG
Nickel, Total	19.1		mg/kg	1.17	--	1	01/04/24 00:42	01/04/24 09:20	EPA 3050B	97,6010D	DMC
Selenium, Total	ND		mg/kg	2.34	--	1	01/04/24 00:42	01/04/24 09:20	EPA 3050B	97,6010D	DMC
Silver, Total	ND		mg/kg	0.467	--	1	01/04/24 00:42	01/04/24 09:20	EPA 3050B	97,6010D	DMC
Thallium, Total	ND		mg/kg	2.34	--	1	01/04/24 00:42	01/04/24 09:20	EPA 3050B	97,6010D	DMC
Vanadium, Total	17.4		mg/kg	0.467	--	1	01/04/24 00:42	01/04/24 09:20	EPA 3050B	97,6010D	DMC
Zinc, Total	56.9		mg/kg	2.34	--	1	01/04/24 00:42	01/04/24 09:20	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL
Lab Number: L2400301
Project Number: 289302
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-02
Client ID: WRA-4
Sample Location: ANDOVER, MA
Date Collected: 01/03/24 11:50
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 73%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.66	--	1	01/04/24 00:42	01/04/24 09:25	EPA 3050B	97,6010D	DMC
Arsenic, Total	9.07		mg/kg	0.533	--	1	01/04/24 00:42	01/04/24 09:25	EPA 3050B	97,6010D	DMC
Barium, Total	27.8		mg/kg	0.533	--	1	01/04/24 00:42	01/04/24 09:25	EPA 3050B	97,6010D	DMC
Beryllium, Total	ND		mg/kg	0.266	--	1	01/04/24 00:42	01/04/24 09:25	EPA 3050B	97,6010D	DMC
Cadmium, Total	ND		mg/kg	0.533	--	1	01/04/24 00:42	01/04/24 09:25	EPA 3050B	97,6010D	DMC
Chromium, Total	15.2		mg/kg	0.533	--	1	01/04/24 00:42	01/04/24 09:25	EPA 3050B	97,6010D	DMC
Lead, Total	21.4		mg/kg	2.66	--	1	01/04/24 00:42	01/04/24 09:25	EPA 3050B	97,6010D	DMC
Mercury, Total	ND		mg/kg	0.099	--	1	01/04/24 01:06	01/04/24 09:20	EPA 7471B	97,7471B	GMG
Nickel, Total	9.22		mg/kg	1.33	--	1	01/04/24 00:42	01/04/24 09:25	EPA 3050B	97,6010D	DMC
Selenium, Total	ND		mg/kg	2.66	--	1	01/04/24 00:42	01/04/24 09:25	EPA 3050B	97,6010D	DMC
Silver, Total	ND		mg/kg	0.533	--	1	01/04/24 00:42	01/04/24 09:25	EPA 3050B	97,6010D	DMC
Thallium, Total	ND		mg/kg	2.66	--	1	01/04/24 00:42	01/04/24 09:25	EPA 3050B	97,6010D	DMC
Vanadium, Total	12.1		mg/kg	0.533	--	1	01/04/24 00:42	01/04/24 09:25	EPA 3050B	97,6010D	DMC
Zinc, Total	34.3		mg/kg	2.66	--	1	01/04/24 00:42	01/04/24 09:25	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400301

Project Number: 289302 **Report Date:** 01/12/24

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-02 Batch: WG1870778-1										
Antimony, Total	ND		mg/kg	2.00	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Arsenic, Total	ND		mg/kg	0.400	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Barium, Total	ND		mg/kg	0.400	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Beryllium, Total	ND		mg/kg	0.200	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Cadmium, Total	ND		mg/kg	0.400	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Chromium, Total	ND		mg/kg	0.400	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Lead, Total	ND		mg/kg	2.00	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Nickel, Total	ND		mg/kg	1.00	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Selenium, Total	ND		mg/kg	2.00	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Silver, Total	ND		mg/kg	0.400	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Thallium, Total	ND		mg/kg	2.00	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Vanadium, Total	ND		mg/kg	0.400	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Zinc, Total	ND		mg/kg	2.00	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC

Prep Information

Digestion Method: EPA 3050B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-02 Batch: WG1870779-1										
Mercury, Total	ND		mg/kg	0.083	--	1	01/04/24 01:06	01/04/24 08:47	97,7471B	GMG

Prep Information

Digestion Method: EPA 7471B

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2400301

Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1870778-2 WG1870778-3 SRM Lot Number: D122-540								
Antimony, Total	164		158		6-194	4		30
Arsenic, Total	109		104		81-119	5		30
Barium, Total	104		91		83-117	13		30
Beryllium, Total	104		101		83-117	3		30
Cadmium, Total	102		98		83-117	4		30
Chromium, Total	101		97		82-118	4		30
Lead, Total	105		101		83-117	4		30
Nickel, Total	105		101		83-117	4		30
Selenium, Total	117		113		81-119	3		30
Silver, Total	104		100		80-120	4		30
Thallium, Total	109		106		81-119	3		30
Vanadium, Total	96		92		80-120	4		30
Zinc, Total	102		99		82-119	3		30
MCP Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1870779-2 WG1870779-3 SRM Lot Number: D122-540								
Mercury, Total	102		96		73-127	6		30

INORGANICS
&
MISCELLANEOUS

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2400301
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-01
Client ID: WRA-3
Sample Location: ANDOVER, MA

Date Collected: 01/03/24 11:00
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	85.2		%	0.100	NA	1	-	01/03/24 16:59	121,2540G	SJB

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2400301
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-02
Client ID: WRA-4
Sample Location: ANDOVER, MA

Date Collected: 01/03/24 11:50
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	73.4		%	0.100	NA	1	-	01/03/24 16:59	121,2540G	SJB

Lab Duplicate Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2400301

Report Date: 01/12/24

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1870710-1 QC Sample: L2400301-01 Client ID: WRA-3						
Solids, Total	85.2	86.2	%	1		20

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2400301
Report Date: 01/12/24

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2400301-01A	Vial MeOH preserved	A	NA		3.3	Y	Absent		MCP-8260HLW-21(14)
L2400301-01B	Vial water preserved	A	NA		3.3	Y	Absent	03-JAN-24 15:17	MCP-8260HLW-21(14)
L2400301-01C	Vial water preserved	A	NA		3.3	Y	Absent	03-JAN-24 15:17	MCP-8260HLW-21(14)
L2400301-01D	Plastic 2oz unpreserved for TS	A	NA		3.3	Y	Absent		TS(7)
L2400301-01E	Metals Only-Glass 60mL/2oz unpreserved	A	NA		3.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-TL-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-ZN-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L2400301-01F	Glass 250ml/8oz unpreserved	A	NA		3.3	Y	Absent		MCP-8082-10(365),MCP-PAH-21(14),TPH-DRO-D(14)
L2400301-02A	Vial MeOH preserved	A	NA		3.3	Y	Absent		MCP-8260HLW-21(14)
L2400301-02B	Vial water preserved	A	NA		3.3	Y	Absent	03-JAN-24 15:17	MCP-8260HLW-21(14)
L2400301-02C	Vial water preserved	A	NA		3.3	Y	Absent	03-JAN-24 15:17	MCP-8260HLW-21(14)
L2400301-02D	Plastic 2oz unpreserved for TS	A	NA		3.3	Y	Absent		TS(7)
L2400301-02E	Metals Only-Glass 60mL/2oz unpreserved	A	NA		3.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-TL-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-ZN-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L2400301-02F	Glass 250ml/8oz unpreserved	A	NA		3.3	Y	Absent		MCP-8082-10(365),A2-MCP-14DX-SIM-21(14),MCP-PAH-21(14),TPH-DRO-D(14)
L2400301-03A	Vial MeOH preserved	A	NA		3.3	Y	Absent		HOLD-8260HLW(14)
L2400301-03B	Vial water preserved	A	NA		3.3	Y	Absent	03-JAN-24 15:17	HOLD-8260HLW(14)

*Values in parentheses indicate holding time in days

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2400301
Project Number:	289302	**Report Date:**	01/12/24

GLOSSARY

Acronyms

DL - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EMPC - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LOD - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

LOQ - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

NR - No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TEF - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.

TEQ - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2400301
Project Number:	289302	**Report Date:**	01/12/24

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2400301
Project Number:	289302	**Report Date:**	01/12/24

Data Qualifiers

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: Data Usability Report

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400301

Project Number: 289302 **Report Date:** 01/12/24

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

141 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA and IIB, November 2021.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE ____ OF ____

Date Rec'd in Lab: 1/3/24

ALPHA Job #: L2400301

ALPHA ANALYTICAL
8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220
320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Client Information

Client: CDM Smith

Address: 75 State Street, Suite 701
Boston MA 02109

Phone: 617-452-6563

Email: JonesNE@cdmsmith.com

Project Information

Project Name: Ledge Rd Landfill

Project Location: Andover, MA

Project #: 289302

Project Manager: Nathan Jones

ALPHA Quote #:

Turn-Around Time

☐ Standard ☑ RUSH (only confirmed if pre-approved)

Date Due: 2 day TAT

Report Information - Data Deliverables

☑ ADEx ☑ EMAIL

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements & Project Information Requirements

☑ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☑ No CT RCP Analytical Methods
☐ Yes ☑ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☑ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☑ No NPDES RGP
☐ Other State /Fed Program ____ Criteria ____

Additional Project Information:

Detection limits for each parameter shall be less than reportable concentrations for RCS-1 Criteria

ANALYSIS

VOC: ☑ 8260 ☐ 624 ☐ 524.2
SVOC: ☐ ABN ☐ PAH
METALS: ☐ MCP 13 ☑ MCP 14 ☐ RCP 15
METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13
EPH: ☐ Ranges & Targets ☐ Ranges Only
VPH: ☐ Ranges & Targets ☐ Ranges Only
☐ PCB ☐ PEST
TPH: ☐ Quant Only ☐ Fingerprint
PAHs - EPA 8270
TPH - MassDEP Method
PCBs - EPA 8082

SAMPLE INFO
Filtration
☐ Field
☐ Lab to do
Preservation
☐ Lab to do

Sample Comments

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	VOC	SVOC	METALS: MCP 14	PAHs - EPA 8270	TPH - MassDEP Method	PCBs - EPA 8082	Sample Comments	TOTAL # BOTTLES
L2400301-01	WRA-3	1/3/24	11:00	Soil	ET	X		X	X	X	X		
-02	WRA-4	1/3/24	11:50	Soil	ET	X		X	X	X	X		

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H = $Na_2S_2O_3$
I= Ascorbic Acid
J = NH_4Cl
K= Zn Acetate
O= Other

Container Type											
Preservative											

Relinquished By:	Date/Time	Received By:	Date/Time
	1/3/24 14:32		1/3/24 1432

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

Method Blank Summary
Form 4
Volatiles

Client	: CDM Smith, Inc.	**Lab Number**	: L2400301
Project Name	: LEDGE RD LANDFILL	**Project Number**	: 289302
Lab Sample ID	: WG1871046-5	**Lab File ID**	: V29240104A05
Instrument ID	: VOA129		
Matrix	: SOIL	**Analysis Date**	: 01/04/24 09:41

Client Sample No.	Lab Sample ID	Analysis Date
WG1871046-3LCS	WG1871046-3	01/04/24 08:17
WG1871046-4LCSD	WG1871046-4	01/04/24 08:38
WRA-3	L2400301-01	01/04/24 11:25
WRA-4	L2400301-02	01/04/24 11:46

Calibration Verification Summary
Form 7
Volatiles

Client	: CDM Smith, Inc.		**Lab Number**	: L2400301	
Project Name	: LEDGE RD LANDFILL		**Project Number**	: 289302	
Instrument ID	: VOA129		**Calibration Date**	: 01/04/24 08:17	
Lab File ID	: V29240104A01		**Init. Calib. Date(s)**	: 12/19/23	12/20/23
Sample No	: WG1871046-2		**Init. Calib. Times**	: 21:48	01:16
Channel	:				

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
Fluorobenzene	1	1	-	0	20	87	0
Dichlorodifluoromethane	0.332	0.167	-	49.7*	20	41	0
Chloromethane	0.42	0.377	-	10.2	20	74	0
Vinyl chloride	0.377	0.317	-	15.9	20	69	0
Bromomethane	0.185	0.153	-	17.3	20	76	0
Chloroethane	0.206	0.195	-	5.3	20	78	0
Trichlorofluoromethane	0.367	0.311	-	15.3	20	69	0
Ethyl ether	0.13	0.115	-	11.5	20	75	0
1,1-Dichloroethene	0.225	0.184	-	18.2	20	68	0
Carbon disulfide	0.786	0.63	-	19.8	20	66	0
Freon-113	0.237	0.201	-	15.2	20	67	0
Acrolein	40	35.033	-	12.4	20	78	0
Methylene chloride	40	34.114	-	14.7	20	71	0
Acetone	40	33.042	-	17.4	20	76	0
trans-1,2-Dichloroethene	0.255	0.218	-	14.5	20	71	0
Methyl acetate	0.254	0.217	-	14.6	20	80	0
Methyl tert-butyl ether	0.671	0.598	-	10.9	20	72	-.01
tert-Butyl alcohol	0.045	0.03	-	33.3*	20	63	-.02
Diisopropyl ether	1.023	1.43	-	-39.8*	20	112	-.01
1,1-Dichloroethane	0.563	0.579	-	-2.8	20	86	0
Halothane	0.193	0.161	-	16.6	20	69	0
Acrylonitrile	0.108	0.11	-	-1.9	20	91	0
Ethyl tert-butyl ether	0.907	0.869	-	4.2	20	76	-.01
Vinyl acetate	0.658	0.633	-	3.8	20	79	0
cis-1,2-Dichloroethene	0.289	0.236	-	18.3	20	67	0
2,2-Dichloropropane	0.35	0.265	-	24.3*	20	63	0
Bromochloromethane	0.134	0.106	-	20.9*	20	67	0
Cyclohexane	0.555	0.539	-	2.9	20	76	0
Chloroform	0.485	0.424	-	12.6	20	72	0
Ethyl acetate	0.302	0.274	-	9.3	20	76	0
Carbon tetrachloride	0.313	0.271	-	13.4	20	69	0
Tetrahydrofuran	0.112	0.093	-	17	20	74	0
Dibromofluoromethane	0.252	0.238	-	5.6	20	82	0
1,1,1-Trichloroethane	0.381	0.336	-	11.8	20	68	0
2-Butanone	0.151	0.124	-	17.9	20	73	0
1,1-Dichloropropene	0.343	0.323	-	5.8	20	73	0
Benzene	0.99	0.901	-	9	20	72	0
tert-Amyl methyl ether	0.633	0.515	-	18.6	20	65	0
1,2-Dichloroethane-d4	0.321	0.333	-	-3.7	20	92	0
1,2-Dichloroethane	0.417	0.389	-	6.7	20	77	0
Methyl cyclohexane	0.428	0.371	-	13.3	20	67	0
Trichloroethene	0.26	0.242	-	6.9	20	72	0
Dibromomethane	0.162	0.134	-	17.3	20	69	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: CDM Smith, Inc.	**Lab Number**	: L2400301
Project Name	: LEDGE RD LANDFILL	**Project Number**	: 289302
Instrument ID	: VOA129	**Calibration Date**	: 01/04/24 08:17
Lab File ID	: V29240104A01	**Init. Calib. Date(s)**	: 12/19/23 12/20/23
Sample No	: WG1871046-2	**Init. Calib. Times**	: 21:48 01:16
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
1,2-Dichloropropane	0.306	0.296	-	3.3	20	77	0
2-Chloroethyl vinyl ether	0.184	0.16	-	13	20	71	-.03
Bromodichloromethane	0.336	0.309	-	8	20	73	0
1,4-Dioxane	0.00323	0.00243*	-	24.8*	20	65	0
cis-1,3-Dichloropropene	0.366	0.326	-	10.9	20	68	0
Chlorobenzene-d5	1	1	-	0	20	88	0
Toluene-d8	1.302	1.256	-	3.5	20	85	0
Toluene	0.875	0.753	-	13.9	20	71	0
4-Methyl-2-pentanone	0.155	0.133	-	14.2	20	70	0
Tetrachloroethene	0.338	0.288	-	14.8	20	67	0
trans-1,3-Dichloropropene	0.445	0.37	-	16.9	20	67	0
Ethyl methacrylate	0.351	0.304	-	13.4	20	70	0
1,1,2-Trichloroethane	0.248	0.223	-	10.1	20	74	0
Chlorodibromomethane	0.307	0.269	-	12.4	20	69	0
1,3-Dichloropropane	0.508	0.457	-	10	20	73	0
1,2-Dibromoethane	0.274	0.241	-	12	20	70	0
2-Hexanone	0.275	0.25	-	9.1	20	75	0
Chlorobenzene	0.945	0.826	-	12.6	20	71	0
Ethylbenzene	1.663	1.502	-	9.7	20	74	0
1,1,1,2-Tetrachloroethane	40	31.36	-	21.6*	20	69	0
p/m Xylene	0.625	0.561	-	10.2	20	72	0
o Xylene	0.606	0.539	-	11.1	20	72	0
Styrene	0.997	0.919	-	7.8	20	72	0
1,4-Dichlorobenzene-d4	1	1	-	0	20	90	0
Bromoform	0.388	0.303	-	21.9*	20	65	0
Isopropylbenzene	3.156	2.888	-	8.5	20	73	0
4-Bromofluorobenzene	0.963	0.931	-	3.3	20	86	0
Bromobenzene	0.786	0.658	-	16.3	20	69	0
n-Propylbenzene	3.818	3.593	-	5.9	20	76	0
1,4-Dichlorobutane	1.245	1.214	-	2.5	20	81	0
1,1,2,2-Tetrachloroethane	0.713	0.629	-	11.8	20	70	0
4-Ethyltoluene	3.149	2.953	-	6.2	20	75	0
2-Chlorotoluene	2.37	2.474	-	-4.4	20	86	0
1,3,5-Trimethylbenzene	2.79	2.526	-	9.5	20	73	0
1,2,3-Trichloropropane	0.642	0.552	-	14	20	72	0
trans-1,4-Dichloro-2-buten	0.263	0.251	-	4.6	20	83	0
4-Chlorotoluene	2.434	2.235	-	8.2	20	75	0
tert-Butylbenzene	2.31	2.086	-	9.7	20	74	0
1,2,4-Trimethylbenzene	2.69	2.479	-	7.8	20	74	0
sec-Butylbenzene	3.438	3.194	-	7.1	20	74	0
p-Isopropyltoluene	2.933	2.728	-	7	20	75	0
1,3-Dichlorobenzene	1.526	1.324	-	13.2	20	71	0
1,4-Dichlorobenzene	1.552	1.32	-	14.9	20	71	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: CDM Smith, Inc.	**Lab Number**	: L2400301
Project Name	: LEDGE RD LANDFILL	**Project Number**	: 289302
Instrument ID	: VOA129	**Calibration Date**	: 01/04/24 08:17
Lab File ID	: V29240104A01	**Init. Calib. Date(s)**	: 12/19/23 12/20/23
Sample No	: WG1871046-2	**Init. Calib. Times**	: 21:48 01:16
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
p-Diethylbenzene	1.805	1.669	-	7.5	20	74	0
n-Butylbenzene	2.679	2.646	-	1.2	20	79	0
1,2-Dichlorobenzene	1.438	1.231	-	14.4	20	72	0
1,2,4,5-Tetramethylbenzene	2.739	2.57	-	6.2	20	75	0
1,2-Dibromo-3-chloropropan	0.115	0.085	-	26.1*	20	64	0
1,3,5-Trichlorobenzene	1.142	1.015	-	11.1	20	75	0
Hexachlorobutadiene	0.554	0.447	-	19.3	20	66	0
1,2,4-Trichlorobenzene	1.012	0.918	-	9.3	20	75	0
Naphthalene	2.453	2.018	-	17.7	20	68	0
1,2,3-Trichlorobenzene	0.973	0.829	-	14.8	20	72	0

* Value outside of QC limits.

ANALYTICAL REPORT

Lab Number:	L2403791
Client:	CDM Smith, Inc. 75 State Street Suite 701 Boston, MA 02109
ATTN:	Nathan Jones
Phone:	(617) 452-6563
Project Name:	LEDGE RD LANDFILL
Project Number:	289302
Report Date:	01/25/24

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2403791
Report Date: 01/25/24

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2403791-01	WRA-1-S	SOIL	ANDOVER, MA	01/22/24 11:30	01/23/24
L2403791-02	WRA-1-N	SOIL	ANDOVER, MA	01/23/24 08:00	01/23/24

Project Name: LEDGE RD LANDFILL **Lab Number:** L2403791

Project Number: 289302 **Report Date:** 01/25/24

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	NO

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2403791
Project Number:	289302	**Report Date:**	01/25/24

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: LEDGE RD LANDFILL **Lab Number:** L2403791
Project Number: 289302 **Report Date:** 01/25/24

Case Narrative (continued)

MCP Related Narratives

Sample Receipt

The analyses performed were specified by the client.

In reference to question H:

A Matrix Spike was not submitted for the analysis of Total Metals.

Volatile Organics

L2403791-01 and -02: Initial calibration utilized a quadratic fit for: 1,1,1,2-tetrachloroethane

In reference to question H:

L2403791-01 and -02: Initial Calibration did not meet:

Lowest Calibration Standard Minimum Response Factor: trichloroethene (0.1904), bromodichloromethane (0.2472), 1,4-dioxane (0.0032), cis-1,3-dichloropropene (0.2490)

Average Response Factor: 1,4-dioxane

Verification: dichlorodifluoromethane (62%)

L2403791-01 and -02: The associated continuing calibration standard is outside the acceptance criteria for several compounds; however, it is within overall method allowances. Associated results are considered to be biased high if the %D is negative and biased low if the %D is positive. A copy of the continuing calibration standard is included as an addendum to this report.

Semivolatile Organics

In reference to question I:

All samples were analyzed for a subset of MCP analytes per client request.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Michelle M. Morris

Title: Technical Director/Representative Date: 01/25/24

QC OUTLIER SUMMARY REPORT

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2403791
Report Date: 01/25/24

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment
MCP Volatile Organics by EPA 5035 Low - Westborough Lab								
8260D	Batch QC	WG1877777-3	Dichlorodifluoromethane	LCS	61	70-130	02	potential low bias
8260D	Batch QC	WG1877777-3	Acetone	LCS	63	70-130	02	potential low bias
8260D	Batch QC	WG1877777-3	1,4-Dioxane	LCS	61	70-130	02	potential low bias
8260D	Batch QC	WG1877777-4	Dichlorodifluoromethane	LCSD	56	70-130	02	potential low bias
8260D	Batch QC	WG1877777-4	Acetone	LCSD	64	70-130	02	potential low bias
8260D	Batch QC	WG1877777-4	1,4-Dioxane	LCSD	65	70-130	02	potential low bias
8260D	Batch QC	WG1878014-3	1,2-Dibromo-3-chloropropane	LCS	68	70-130	01	potential low bias
8260D	Batch QC	WG1878014-3	1,4-Dioxane	LCS	60	70-130	01	potential low bias
8260D	Batch QC	WG1878014-4	1,4-Dioxane	LCSD	62	70-130	01	potential low bias
MCP Semivolatile Organics - Westborough Lab								
8270E	Batch QC (L2403791-02)	WG1877486-5	Pyrene	Duplicate	83	30	01-02	non-directional bias

ORGANICS

VOLATILES

Project Name: LEDGE RD LANDFILL **Lab Number:** L2403791

Project Number: 289302 **Report Date:** 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-01 Date Collected: 01/22/24 11:30
Client ID: WRA-1-S Date Received: 01/23/24
Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8260D
Analytical Date: 01/24/24 23:43
Analyst: JIC
Percent Solids: 54%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Methylene chloride	ND		ug/kg	46	--	1
1,1-Dichloroethane	ND		ug/kg	9.2	--	1
Chloroform	ND		ug/kg	14	--	1
Carbon tetrachloride	ND		ug/kg	9.2	--	1
1,2-Dichloropropane	ND		ug/kg	9.2	--	1
Dibromochloromethane	ND		ug/kg	9.2	--	1
1,1,2-Trichloroethane	ND		ug/kg	9.2	--	1
Tetrachloroethene	ND		ug/kg	4.6	--	1
Chlorobenzene	ND		ug/kg	4.6	--	1
Trichlorofluoromethane	ND		ug/kg	37	--	1
1,2-Dichloroethane	ND		ug/kg	9.2	--	1
1,1,1-Trichloroethane	ND		ug/kg	4.6	--	1
Bromodichloromethane	ND		ug/kg	4.6	--	1
trans-1,3-Dichloropropene	ND		ug/kg	9.2	--	1
cis-1,3-Dichloropropene	ND		ug/kg	4.6	--	1
1,3-Dichloropropene, Total	ND		ug/kg	4.6	--	1
1,1-Dichloropropene	ND		ug/kg	4.6	--	1
Bromoform	ND		ug/kg	37	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	4.6	--	1
Benzene	ND		ug/kg	4.6	--	1
Toluene	ND		ug/kg	9.2	--	1
Ethylbenzene	ND		ug/kg	9.2	--	1
Chloromethane	ND		ug/kg	37	--	1
Bromomethane	ND		ug/kg	18	--	1
Vinyl chloride	ND		ug/kg	9.2	--	1
Chloroethane	ND		ug/kg	18	--	1
1,1-Dichloroethene	ND		ug/kg	9.2	--	1
trans-1,2-Dichloroethene	ND		ug/kg	14	--	1

Project Name: LEDGE RD LANDFILL **Lab Number:** L2403791

Project Number: 289302 **Report Date:** 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-01 Date Collected: 01/22/24 11:30

Client ID: WRA-1-S Date Received: 01/23/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Trichloroethene	ND		ug/kg	4.6	--	1
1,2-Dichlorobenzene	ND		ug/kg	18	--	1
1,3-Dichlorobenzene	ND		ug/kg	18	--	1
1,4-Dichlorobenzene	ND		ug/kg	18	--	1
Methyl tert butyl ether	ND		ug/kg	18	--	1
p/m-Xylene	ND		ug/kg	18	--	1
o-Xylene	ND		ug/kg	9.2	--	1
Xylenes, Total	ND		ug/kg	9.2	--	1
cis-1,2-Dichloroethene	ND		ug/kg	9.2	--	1
1,2-Dichloroethene, Total	ND		ug/kg	9.2	--	1
Dibromomethane	ND		ug/kg	18	--	1
1,2,3-Trichloropropane	ND		ug/kg	18	--	1
Styrene	ND		ug/kg	9.2	--	1
Dichlorodifluoromethane	ND		ug/kg	92	--	1
Acetone	1200		ug/kg	230	--	1
Carbon disulfide	ND		ug/kg	92	--	1
Methyl ethyl ketone	280		ug/kg	92	--	1
Methyl isobutyl ketone	ND		ug/kg	92	--	1
2-Hexanone	ND		ug/kg	92	--	1
Bromochloromethane	ND		ug/kg	18	--	1
Tetrahydrofuran	ND		ug/kg	37	--	1
2,2-Dichloropropane	ND		ug/kg	18	--	1
1,2-Dibromoethane	ND		ug/kg	9.2	--	1
1,3-Dichloropropane	ND		ug/kg	18	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	4.6	--	1
Bromobenzene	ND		ug/kg	18	--	1
n-Butylbenzene	ND		ug/kg	9.2	--	1
sec-Butylbenzene	ND		ug/kg	9.2	--	1
tert-Butylbenzene	ND		ug/kg	18	--	1
o-Chlorotoluene	ND		ug/kg	18	--	1
p-Chlorotoluene	ND		ug/kg	18	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	28	--	1
Hexachlorobutadiene	ND		ug/kg	37	--	1
Isopropylbenzene	ND		ug/kg	9.2	--	1
p-Isopropyltoluene	ND		ug/kg	9.2	--	1
Naphthalene	ND		ug/kg	37	--	1
n-Propylbenzene	ND		ug/kg	9.2	--	1

Project Name: LEDGE RD LANDFILL **Lab Number:** L2403791

Project Number: 289302 **Report Date:** 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-01 Date Collected: 01/22/24 11:30

Client ID: WRA-1-S Date Received: 01/23/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	18	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	18	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	18	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	18	--	1
Diethyl ether	ND		ug/kg	18	--	1
Diisopropyl Ether	ND		ug/kg	18	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	18	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	18	--	1
1,4-Dioxane	ND		ug/kg	740	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	116		70-130
Toluene-d8	107		70-130
4-Bromofluorobenzene	107		70-130
Dibromofluoromethane	108		70-130

Project Name: LEDGE RD LANDFILL **Lab Number:** L2403791

Project Number: 289302 **Report Date:** 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-02 Date Collected: 01/23/24 08:00
Client ID: WRA-1-N Date Received: 01/23/24
Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8260D
Analytical Date: 01/24/24 11:36
Analyst: SLS
Percent Solids: 72%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Methylene chloride	ND		ug/kg	24	--	1
1,1-Dichloroethane	ND		ug/kg	4.7	--	1
Chloroform	ND		ug/kg	7.1	--	1
Carbon tetrachloride	ND		ug/kg	4.7	--	1
1,2-Dichloropropane	ND		ug/kg	4.7	--	1
Dibromochloromethane	ND		ug/kg	4.7	--	1
1,1,2-Trichloroethane	ND		ug/kg	4.7	--	1
Tetrachloroethene	ND		ug/kg	2.4	--	1
Chlorobenzene	ND		ug/kg	2.4	--	1
Trichlorofluoromethane	ND		ug/kg	19	--	1
1,2-Dichloroethane	ND		ug/kg	4.7	--	1
1,1,1-Trichloroethane	ND		ug/kg	2.4	--	1
Bromodichloromethane	ND		ug/kg	2.4	--	1
trans-1,3-Dichloropropene	ND		ug/kg	4.7	--	1
cis-1,3-Dichloropropene	ND		ug/kg	2.4	--	1
1,3-Dichloropropene, Total	ND		ug/kg	2.4	--	1
1,1-Dichloropropene	ND		ug/kg	2.4	--	1
Bromoform	ND		ug/kg	19	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	2.4	--	1
Benzene	ND		ug/kg	2.4	--	1
Toluene	ND		ug/kg	4.7	--	1
Ethylbenzene	ND		ug/kg	4.7	--	1
Chloromethane	ND		ug/kg	19	--	1
Bromomethane	ND		ug/kg	9.5	--	1
Vinyl chloride	ND		ug/kg	4.7	--	1
Chloroethane	ND		ug/kg	9.5	--	1
1,1-Dichloroethene	ND		ug/kg	4.7	--	1
trans-1,2-Dichloroethene	ND		ug/kg	7.1	--	1

Project Name: LEDGE RD LANDFILL **Lab Number:** L2403791

Project Number: 289302 **Report Date:** 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-02 Date Collected: 01/23/24 08:00

Client ID: WRA-1-N Date Received: 01/23/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Trichloroethene	ND		ug/kg	2.4	--	1
1,2-Dichlorobenzene	ND		ug/kg	9.5	--	1
1,3-Dichlorobenzene	ND		ug/kg	9.5	--	1
1,4-Dichlorobenzene	ND		ug/kg	9.5	--	1
Methyl tert butyl ether	ND		ug/kg	9.5	--	1
p/m-Xylene	ND		ug/kg	9.5	--	1
o-Xylene	ND		ug/kg	4.7	--	1
Xylenes, Total	ND		ug/kg	4.7	--	1
cis-1,2-Dichloroethene	ND		ug/kg	4.7	--	1
1,2-Dichloroethene, Total	ND		ug/kg	4.7	--	1
Dibromomethane	ND		ug/kg	9.5	--	1
1,2,3-Trichloropropane	ND		ug/kg	9.5	--	1
Styrene	ND		ug/kg	4.7	--	1
Dichlorodifluoromethane	ND		ug/kg	47	--	1
Acetone	ND		ug/kg	120	--	1
Carbon disulfide	ND		ug/kg	47	--	1
Methyl ethyl ketone	ND		ug/kg	47	--	1
Methyl isobutyl ketone	ND		ug/kg	47	--	1
2-Hexanone	ND		ug/kg	47	--	1
Bromochloromethane	ND		ug/kg	9.5	--	1
Tetrahydrofuran	ND		ug/kg	19	--	1
2,2-Dichloropropane	ND		ug/kg	9.5	--	1
1,2-Dibromoethane	ND		ug/kg	4.7	--	1
1,3-Dichloropropane	ND		ug/kg	9.5	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	2.4	--	1
Bromobenzene	ND		ug/kg	9.5	--	1
n-Butylbenzene	ND		ug/kg	4.7	--	1
sec-Butylbenzene	ND		ug/kg	4.7	--	1
tert-Butylbenzene	ND		ug/kg	9.5	--	1
o-Chlorotoluene	ND		ug/kg	9.5	--	1
p-Chlorotoluene	ND		ug/kg	9.5	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	14	--	1
Hexachlorobutadiene	ND		ug/kg	19	--	1
Isopropylbenzene	ND		ug/kg	4.7	--	1
p-Isopropyltoluene	ND		ug/kg	4.7	--	1
Naphthalene	ND		ug/kg	19	--	1
n-Propylbenzene	ND		ug/kg	4.7	--	1

Project Name: LEDGE RD LANDFILL **Lab Number:** L2403791

Project Number: 289302 **Report Date:** 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-02 Date Collected: 01/23/24 08:00

Client ID: WRA-1-N Date Received: 01/23/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	9.5	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	9.5	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	9.5	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	9.5	--	1
Diethyl ether	ND		ug/kg	9.5	--	1
Diisopropyl Ether	ND		ug/kg	9.5	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	9.5	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	9.5	--	1
1,4-Dioxane	ND		ug/kg	380	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	108		70-130
Toluene-d8	102		70-130
4-Bromofluorobenzene	101		70-130
Dibromofluoromethane	104		70-130

Project Name: LEDGE RD LANDFILL **Lab Number:** L2403791

Project Number: 289302 **Report Date:** 01/25/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 01/24/24 09:03
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 02 Batch: WG1877777-5					
Methylene chloride	ND		ug/kg	5.0	--
1,1-Dichloroethane	ND		ug/kg	1.0	--
Chloroform	ND		ug/kg	1.5	--
Carbon tetrachloride	ND		ug/kg	1.0	--
1,2-Dichloropropane	ND		ug/kg	1.0	--
Dibromochloromethane	ND		ug/kg	1.0	--
1,1,2-Trichloroethane	ND		ug/kg	1.0	--
Tetrachloroethene	ND		ug/kg	0.50	--
Chlorobenzene	ND		ug/kg	0.50	--
Trichlorofluoromethane	ND		ug/kg	4.0	--
1,2-Dichloroethane	ND		ug/kg	1.0	--
1,1,1-Trichloroethane	ND		ug/kg	0.50	--
Bromodichloromethane	ND		ug/kg	0.50	--
trans-1,3-Dichloropropene	ND		ug/kg	1.0	--
cis-1,3-Dichloropropene	ND		ug/kg	0.50	--
1,3-Dichloropropene, Total	ND		ug/kg	0.50	--
1,1-Dichloropropene	ND		ug/kg	0.50	--
Bromoform	ND		ug/kg	4.0	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.50	--
Benzene	ND		ug/kg	0.50	--
Toluene	ND		ug/kg	1.0	--
Ethylbenzene	ND		ug/kg	1.0	--
Chloromethane	ND		ug/kg	4.0	--
Bromomethane	ND		ug/kg	2.0	--
Vinyl chloride	ND		ug/kg	1.0	--
Chloroethane	ND		ug/kg	2.0	--
1,1-Dichloroethene	ND		ug/kg	1.0	--
trans-1,2-Dichloroethene	ND		ug/kg	1.5	--
Trichloroethene	ND		ug/kg	0.50	--

Project Name: LEDGE RD LANDFILL **Lab Number:** L2403791

Project Number: 289302 **Report Date:** 01/25/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 01/24/24 09:03
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 02 Batch: WG1877777-5					
1,2-Dichlorobenzene	ND		ug/kg	2.0	--
1,3-Dichlorobenzene	ND		ug/kg	2.0	--
1,4-Dichlorobenzene	ND		ug/kg	2.0	--
Methyl tert butyl ether	ND		ug/kg	2.0	--
p/m-Xylene	ND		ug/kg	2.0	--
o-Xylene	ND		ug/kg	1.0	--
Xylenes, Total	ND		ug/kg	1.0	--
cis-1,2-Dichloroethene	ND		ug/kg	1.0	--
1,2-Dichloroethene, Total	ND		ug/kg	1.0	--
Dibromomethane	ND		ug/kg	2.0	--
1,2,3-Trichloropropane	ND		ug/kg	2.0	--
Styrene	ND		ug/kg	1.0	--
Dichlorodifluoromethane	ND		ug/kg	10	--
Acetone	ND		ug/kg	25	--
Carbon disulfide	ND		ug/kg	10	--
Methyl ethyl ketone	ND		ug/kg	10	--
Methyl isobutyl ketone	ND		ug/kg	10	--
2-Hexanone	ND		ug/kg	10	--
Bromochloromethane	ND		ug/kg	2.0	--
Tetrahydrofuran	ND		ug/kg	4.0	--
2,2-Dichloropropane	ND		ug/kg	2.0	--
1,2-Dibromoethane	ND		ug/kg	1.0	--
1,3-Dichloropropane	ND		ug/kg	2.0	--
1,1,1,2-Tetrachloroethane	ND		ug/kg	0.50	--
Bromobenzene	ND		ug/kg	2.0	--
n-Butylbenzene	ND		ug/kg	1.0	--
sec-Butylbenzene	ND		ug/kg	1.0	--
tert-Butylbenzene	ND		ug/kg	2.0	--
o-Chlorotoluene	ND		ug/kg	2.0	--

Project Name: LEDGE RD LANDFILL **Lab Number:** L2403791

Project Number: 289302 **Report Date:** 01/25/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 01/24/24 09:03
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 02 Batch: WG1877777-5					
p-Chlorotoluene	ND		ug/kg	2.0	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	3.0	--
Hexachlorobutadiene	ND		ug/kg	4.0	--
Isopropylbenzene	ND		ug/kg	1.0	--
p-Isopropyltoluene	ND		ug/kg	1.0	--
Naphthalene	ND		ug/kg	4.0	--
n-Propylbenzene	ND		ug/kg	1.0	--
1,2,3-Trichlorobenzene	ND		ug/kg	2.0	--
1,2,4-Trichlorobenzene	ND		ug/kg	2.0	--
1,3,5-Trimethylbenzene	ND		ug/kg	2.0	--
1,2,4-Trimethylbenzene	ND		ug/kg	2.0	--
Diethyl ether	ND		ug/kg	2.0	--
Diisopropyl Ether	ND		ug/kg	2.0	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	2.0	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	2.0	--
1,4-Dioxane	ND		ug/kg	80	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	113		70-130
Toluene-d8	102		70-130
4-Bromofluorobenzene	101		70-130
Dibromofluoromethane	105		70-130

Project Name: LEDGE RD LANDFILL **Lab Number:** L2403791

Project Number: 289302 **Report Date:** 01/25/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 01/24/24 19:34
Analyst: SLS

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1878014-5					
Methylene chloride	ND		ug/kg	5.0	--
1,1-Dichloroethane	ND		ug/kg	1.0	--
Chloroform	ND		ug/kg	1.5	--
Carbon tetrachloride	ND		ug/kg	1.0	--
1,2-Dichloropropane	ND		ug/kg	1.0	--
Dibromochloromethane	ND		ug/kg	1.0	--
1,1,2-Trichloroethane	ND		ug/kg	1.0	--
Tetrachloroethene	ND		ug/kg	0.50	--
Chlorobenzene	ND		ug/kg	0.50	--
Trichlorofluoromethane	ND		ug/kg	4.0	--
1,2-Dichloroethane	ND		ug/kg	1.0	--
1,1,1-Trichloroethane	ND		ug/kg	0.50	--
Bromodichloromethane	ND		ug/kg	0.50	--
trans-1,3-Dichloropropene	ND		ug/kg	1.0	--
cis-1,3-Dichloropropene	ND		ug/kg	0.50	--
1,3-Dichloropropene, Total	ND		ug/kg	0.50	--
1,1-Dichloropropene	ND		ug/kg	0.50	--
Bromoform	ND		ug/kg	4.0	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.50	--
Benzene	ND		ug/kg	0.50	--
Toluene	ND		ug/kg	1.0	--
Ethylbenzene	ND		ug/kg	1.0	--
Chloromethane	ND		ug/kg	4.0	--
Bromomethane	ND		ug/kg	2.0	--
Vinyl chloride	ND		ug/kg	1.0	--
Chloroethane	ND		ug/kg	2.0	--
1,1-Dichloroethene	ND		ug/kg	1.0	--
trans-1,2-Dichloroethene	ND		ug/kg	1.5	--
Trichloroethene	ND		ug/kg	0.50	--

Project Name: LEDGE RD LANDFILL **Lab Number:** L2403791

Project Number: 289302 **Report Date:** 01/25/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 01/24/24 19:34
Analyst: SLS

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1878014-5					
1,2-Dichlorobenzene	ND		ug/kg	2.0	--
1,3-Dichlorobenzene	ND		ug/kg	2.0	--
1,4-Dichlorobenzene	ND		ug/kg	2.0	--
Methyl tert butyl ether	ND		ug/kg	2.0	--
p/m-Xylene	ND		ug/kg	2.0	--
o-Xylene	ND		ug/kg	1.0	--
Xylenes, Total	ND		ug/kg	1.0	--
cis-1,2-Dichloroethene	ND		ug/kg	1.0	--
1,2-Dichloroethene, Total	ND		ug/kg	1.0	--
Dibromomethane	ND		ug/kg	2.0	--
1,2,3-Trichloropropane	ND		ug/kg	2.0	--
Styrene	ND		ug/kg	1.0	--
Dichlorodifluoromethane	ND		ug/kg	10	--
Acetone	ND		ug/kg	25	--
Carbon disulfide	ND		ug/kg	10	--
Methyl ethyl ketone	ND		ug/kg	10	--
Methyl isobutyl ketone	ND		ug/kg	10	--
2-Hexanone	ND		ug/kg	10	--
Bromochloromethane	ND		ug/kg	2.0	--
Tetrahydrofuran	ND		ug/kg	4.0	--
2,2-Dichloropropane	ND		ug/kg	2.0	--
1,2-Dibromoethane	ND		ug/kg	1.0	--
1,3-Dichloropropane	ND		ug/kg	2.0	--
1,1,1,2-Tetrachloroethane	ND		ug/kg	0.50	--
Bromobenzene	ND		ug/kg	2.0	--
n-Butylbenzene	ND		ug/kg	1.0	--
sec-Butylbenzene	ND		ug/kg	1.0	--
tert-Butylbenzene	ND		ug/kg	2.0	--
o-Chlorotoluene	ND		ug/kg	2.0	--

Project Name: LEDGE RD LANDFILL **Lab Number:** L2403791

Project Number: 289302 **Report Date:** 01/25/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 01/24/24 19:34
Analyst: SLS

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1878014-5					
p-Chlorotoluene	ND		ug/kg	2.0	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	3.0	--
Hexachlorobutadiene	ND		ug/kg	4.0	--
Isopropylbenzene	ND		ug/kg	1.0	--
p-Isopropyltoluene	ND		ug/kg	1.0	--
Naphthalene	ND		ug/kg	4.0	--
n-Propylbenzene	ND		ug/kg	1.0	--
1,2,3-Trichlorobenzene	ND		ug/kg	2.0	--
1,2,4-Trichlorobenzene	ND		ug/kg	2.0	--
1,3,5-Trimethylbenzene	ND		ug/kg	2.0	--
1,2,4-Trimethylbenzene	ND		ug/kg	2.0	--
Diethyl ether	ND		ug/kg	2.0	--
Diisopropyl Ether	ND		ug/kg	2.0	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	2.0	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	2.0	--
1,4-Dioxane	ND		ug/kg	80	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	118		70-130
Toluene-d8	102		70-130
4-Bromofluorobenzene	95		70-130
Dibromofluoromethane	109		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2403791
Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 02 Batch: WG1877777-3 WG1877777-4								
Methylene chloride	86		81		70-130	6		20
1,1-Dichloroethane	92		87		70-130	6		20
Chloroform	87		83		70-130	5		20
Carbon tetrachloride	90		88		70-130	2		20
1,2-Dichloropropane	94		90		70-130	4		20
Dibromochloromethane	86		87		70-130	1		20
1,1,2-Trichloroethane	88		86		70-130	2		20
Tetrachloroethene	91		88		70-130	3		20
Chlorobenzene	91		87		70-130	4		20
Trichlorofluoromethane	82		78		70-130	5		20
1,2-Dichloroethane	88		86		70-130	2		20
1,1,1-Trichloroethane	91		88		70-130	3		20
Bromodichloromethane	89		89		70-130	0		20
trans-1,3-Dichloropropene	86		86		70-130	0		20
cis-1,3-Dichloropropene	89		89		70-130	0		20
1,1-Dichloropropene	94		90		70-130	4		20
Bromoform	76		80		70-130	5		20
1,1,2,2-Tetrachloroethane	81		84		70-130	4		20
Benzene	92		88		70-130	4		20
Toluene	90		85		70-130	6		20
Ethylbenzene	94		89		70-130	5		20
Chloromethane	99		90		70-130	10		20
Bromomethane	93		87		70-130	7		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2403791
Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 02 Batch: WG1877777-3 WG1877777-4								
Vinyl chloride	89		83		70-130	7		20
Chloroethane	96		92		70-130	4		20
1,1-Dichloroethene	84		79		70-130	6		20
trans-1,2-Dichloroethene	86		80		70-130	7		20
Trichloroethene	94		91		70-130	3		20
1,2-Dichlorobenzene	87		84		70-130	4		20
1,3-Dichlorobenzene	88		86		70-130	2		20
1,4-Dichlorobenzene	88		85		70-130	3		20
Methyl tert butyl ether	86		86		70-130	0		20
p/m-Xylene	93		89		70-130	4		20
o-Xylene	92		88		70-130	4		20
cis-1,2-Dichloroethene	84		81		70-130	4		20
Dibromomethane	79		80		70-130	1		20
1,2,3-Trichloropropane	79		80		70-130	1		20
Styrene	94		90		70-130	4		20
Dichlorodifluoromethane	**61**	Q	**56**	Q	70-130	9		20
Acetone	**63**	Q	**64**	Q	70-130	2		20
Carbon disulfide	86		84		70-130	2		20
Methyl ethyl ketone	70		71		70-130	1		20
Methyl isobutyl ketone	74		79		70-130	7		20
2-Hexanone	75		80		70-130	6		20
Bromochloromethane	79		78		70-130	1		20
Tetrahydrofuran	70		72		70-130	3		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2403791
Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 02 Batch: WG1877777-3 WG1877777-4								
2,2-Dichloropropane	85		84		70-130	1		20
1,2-Dibromoethane	85		87		70-130	2		20
1,3-Dichloropropane	87		86		70-130	1		20
1,1,1,2-Tetrachloroethane	81		80		70-130	1		20
Bromobenzene	85		83		70-130	2		20
n-Butylbenzene	100		96		70-130	4		20
sec-Butylbenzene	95		91		70-130	4		20
tert-Butylbenzene	92		88		70-130	4		20
o-Chlorotoluene	105		102		70-130	3		20
p-Chlorotoluene	92		90		70-130	2		20
1,2-Dibromo-3-chloropropane	70		74		70-130	6		20
Hexachlorobutadiene	84		82		70-130	2		20
Isopropylbenzene	94		90		70-130	4		20
p-Isopropyltoluene	96		92		70-130	4		20
Naphthalene	80		83		70-130	4		20
n-Propylbenzene	97		92		70-130	5		20
1,2,3-Trichlorobenzene	86		86		70-130	0		20
1,2,4-Trichlorobenzene	91		91		70-130	0		20
1,3,5-Trimethylbenzene	94		89		70-130	5		20
1,2,4-Trimethylbenzene	93		91		70-130	2		20
Diethyl ether	86		83		70-130	4		20
Diisopropyl Ether	104		99		70-130	5		20
Ethyl-Tert-Butyl-Ether	93		91		70-130	2		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2403791

Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 02 Batch: WG1877777-3 WG1877777-4								
Tertiary-Amyl Methyl Ether	81		82		70-130	1		20
1,4-Dioxane	**61**	Q	**65**	Q	70-130	6		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	102		104		70-130
Toluene-d8	104		103		70-130
4-Bromofluorobenzene	101		100		70-130
Dibromofluoromethane	96		97		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2403791
Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1878014-3 WG1878014-4								
Methylene chloride	89		88		70-130	1		20
1,1-Dichloroethane	97		93		70-130	4		20
Chloroform	91		88		70-130	3		20
Carbon tetrachloride	96		93		70-130	3		20
1,2-Dichloropropane	98		96		70-130	2		20
Dibromochloromethane	91		91		70-130	0		20
1,1,2-Trichloroethane	90		89		70-130	1		20
Tetrachloroethene	95		91		70-130	4		20
Chlorobenzene	95		91		70-130	4		20
Trichlorofluoromethane	93		89		70-130	4		20
1,2-Dichloroethane	91		91		70-130	0		20
1,1,1-Trichloroethane	96		92		70-130	4		20
Bromodichloromethane	94		94		70-130	0		20
trans-1,3-Dichloropropene	88		87		70-130	1		20
cis-1,3-Dichloropropene	92		92		70-130	0		20
1,1-Dichloropropene	99		93		70-130	6		20
Bromoform	79		83		70-130	5		20
1,1,2,2-Tetrachloroethane	83		86		70-130	4		20
Benzene	96		93		70-130	3		20
Toluene	95		91		70-130	4		20
Ethylbenzene	98		94		70-130	4		20
Chloromethane	110		104		70-130	6		20
Bromomethane	98		93		70-130	5		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2403791
Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1878014-3 WG1878014-4								
Vinyl chloride	99		91		70-130	8		20
Chloroethane	104		98		70-130	6		20
1,1-Dichloroethene	92		85		70-130	8		20
trans-1,2-Dichloroethene	90		87		70-130	3		20
Trichloroethene	100		95		70-130	5		20
1,2-Dichlorobenzene	89		88		70-130	1		20
1,3-Dichlorobenzene	92		90		70-130	2		20
1,4-Dichlorobenzene	90		89		70-130	1		20
Methyl tert butyl ether	85		86		70-130	1		20
p/m-Xylene	98		94		70-130	4		20
o-Xylene	97		93		70-130	4		20
cis-1,2-Dichloroethene	89		84		70-130	6		20
Dibromomethane	82		82		70-130	0		20
1,2,3-Trichloropropane	80		82		70-130	2		20
Styrene	98		95		70-130	3		20
Dichlorodifluoromethane	76		70		70-130	8		20
Acetone	73		74		70-130	1		20
Carbon disulfide	91		89		70-130	2		20
Methyl ethyl ketone	75		80		70-130	6		20
Methyl isobutyl ketone	74		78		70-130	5		20
2-Hexanone	78		80		70-130	3		20
Bromochloromethane	81		82		70-130	1		20
Tetrahydrofuran	75		75		70-130	0		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2403791
Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab	Associated sample(s): 01		Batch: WG1878014-3 WG1878014-4					
2,2-Dichloropropane	87		86		70-130	1		20
1,2-Dibromoethane	86		87		70-130	1		20
1,3-Dichloropropane	90		90		70-130	0		20
1,1,1,2-Tetrachloroethane	84		84		70-130	0		20
Bromobenzene	86		85		70-130	1		20
n-Butylbenzene	106		102		70-130	4		20
sec-Butylbenzene	101		97		70-130	4		20
tert-Butylbenzene	97		92		70-130	5		20
o-Chlorotoluene	96		87		70-130	10		20
p-Chlorotoluene	97		94		70-130	3		20
1,2-Dibromo-3-chloropropane	**68**	Q	74		70-130	8		20
Hexachlorobutadiene	86		85		70-130	1		20
Isopropylbenzene	97		95		70-130	2		20
p-Isopropyltoluene	99		96		70-130	3		20
Naphthalene	78		79		70-130	1		20
n-Propylbenzene	100		97		70-130	3		20
1,2,3-Trichlorobenzene	87		87		70-130	0		20
1,2,4-Trichlorobenzene	92		91		70-130	1		20
1,3,5-Trimethylbenzene	97		95		70-130	2		20
1,2,4-Trimethylbenzene	97		94		70-130	3		20
Diethyl ether	89		89		70-130	0		20
Diisopropyl Ether	111		107		70-130	4		20
Ethyl-Tert-Butyl-Ether	93		92		70-130	1		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2403791

Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1878014-3 WG1878014-4								
Tertiary-Amyl Methyl Ether	79		79		70-130	0		20
1,4-Dioxane	**60**	Q	**62**	Q	70-130	3		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	102		105		70-130
Toluene-d8	107		105		70-130
4-Bromofluorobenzene	100		101		70-130
Dibromofluoromethane	99		101		70-130

SEMIVOLATILES

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2403791
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-01
Client ID: WRA-1-S
Sample Location: ANDOVER, MA

Date Collected: 01/22/24 11:30
Date Received: 01/23/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8270E
Analytical Date: 01/24/24 14:27
Analyst: IM
Percent Solids: 54%

Extraction Method: EPA 3546
Extraction Date: 01/23/24 21:55

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP PAHs - Westborough Lab						
Acenaphthene	ND		ug/kg	240	--	1
Fluoranthene	600		ug/kg	180	--	1
Naphthalene	ND		ug/kg	300	--	1
Benzo(a)anthracene	390		ug/kg	180	--	1
Benzo(a)pyrene	410		ug/kg	240	--	1
Benzo(b)fluoranthene	480		ug/kg	180	--	1
Benzo(k)fluoranthene	180		ug/kg	180	--	1
Chrysene	390		ug/kg	180	--	1
Acenaphthylene	ND		ug/kg	240	--	1
Anthracene	ND		ug/kg	180	--	1
Benzo(ghi)perylene	ND		ug/kg	240	--	1
Fluorene	ND		ug/kg	300	--	1
Phenanthrene	400		ug/kg	180	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	130	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	240	--	1
Pyrene	650		ug/kg	180	--	1
2-Methylnaphthalene	ND		ug/kg	130	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	59		30-130
2-Fluorobiphenyl	65		30-130
4-Terphenyl-d14	62		30-130

Project Name: LEDGE RD LANDFILL
Lab Number: L2403791
Project Number: 289302
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-02
Client ID: WRA-1-N
Sample Location: ANDOVER, MA

Date Collected: 01/23/24 08:00
Date Received: 01/23/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8270E
Analytical Date: 01/24/24 14:44
Analyst: IM
Percent Solids: 72%

Extraction Method: EPA 3546
Extraction Date: 01/23/24 21:55

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP PAHs - Westborough Lab						
Acenaphthene	ND		ug/kg	180	--	1
Fluoranthene	ND		ug/kg	140	--	1
Naphthalene	ND		ug/kg	230	--	1
Benzo(a)anthracene	ND		ug/kg	140	--	1
Benzo(a)pyrene	ND		ug/kg	180	--	1
Benzo(b)fluoranthene	ND		ug/kg	140	--	1
Benzo(k)fluoranthene	ND		ug/kg	140	--	1
Chrysene	ND		ug/kg	140	--	1
Acenaphthylene	ND		ug/kg	180	--	1
Anthracene	ND		ug/kg	140	--	1
Benzo(ghi)perylene	ND		ug/kg	180	--	1
Fluorene	ND		ug/kg	230	--	1
Phenanthrene	ND		ug/kg	140	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	97	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	180	--	1
Pyrene	140		ug/kg	140	--	1
2-Methylnaphthalene	ND		ug/kg	97	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	71		30-130
2-Fluorobiphenyl	75		30-130
4-Terphenyl-d14	74		30-130

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2403791
Report Date: 01/25/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E
Analytical Date: 01/24/24 09:25
Analyst: IM

Extraction Method: EPA 3546
Extraction Date: 01/23/24 21:55

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-02 Batch: WG1877486-1					
Acenaphthene	ND		ug/kg	130	--
Fluoranthene	ND		ug/kg	98	--
Naphthalene	ND		ug/kg	160	--
Benzo(a)anthracene	ND		ug/kg	98	--
Benzo(a)pyrene	ND		ug/kg	130	--
Benzo(b)fluoranthene	ND		ug/kg	98	--
Benzo(k)fluoranthene	ND		ug/kg	98	--
Chrysene	ND		ug/kg	98	--
Acenaphthylene	ND		ug/kg	130	--
Anthracene	ND		ug/kg	98	--
Benzo(ghi)perylene	ND		ug/kg	130	--
Fluorene	ND		ug/kg	160	--
Phenanthrene	ND		ug/kg	98	--
Dibenzo(a,h)anthracene	ND		ug/kg	68	--
Indeno(1,2,3-cd)pyrene	ND		ug/kg	130	--
Pyrene	ND		ug/kg	98	--
2-Methylnaphthalene	ND		ug/kg	68	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	50		30-130
2-Fluorobiphenyl	53		30-130
4-Terphenyl-d14	74		30-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2403791
Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG1877486-2 WG1877486-3								
Acenaphthene	58		61		40-140	5		30
Fluoranthene	70		73		40-140	4		30
Naphthalene	56		63		40-140	12		30
Benzo(a)anthracene	67		69		40-140	3		30
Benzo(a)pyrene	75		79		40-140	5		30
Benzo(b)fluoranthene	68		71		40-140	4		30
Benzo(k)fluoranthene	69		71		40-140	3		30
Chrysene	66		69		40-140	4		30
Acenaphthylene	63		69		40-140	9		30
Anthracene	66		70		40-140	6		30
Benzo(ghi)perylene	60		62		40-140	3		30
Fluorene	61		66		40-140	8		30
Phenanthrene	64		66		40-140	3		30
Dibenzo(a,h)anthracene	61		63		40-140	3		30
Indeno(1,2,3-cd)pyrene	62		63		40-140	2		30
Pyrene	70		74		40-140	6		30
2-Methylnaphthalene	61		68		40-140	11		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2403791
Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG1877486-2 WG1877486-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Nitrobenzene-d5	56		63		30-130
2-Fluorobiphenyl	63		67		30-130
4-Terphenyl-d14	74		77		30-130

Matrix Spike Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2403791
Report Date: 01/25/24

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1877486-4 QC Sample: L2403791-02 Client ID: WRA-1-N												
Acenaphthene	ND	1820	970	53		-	-		40-140	-		30
Fluoranthene	ND	1820	1200	66		-	-		40-140	-		30
Naphthalene	ND	1820	1100	60		-	-		40-140	-		30
Benzo(a)anthracene	ND	1820	1100	60		-	-		40-140	-		30
Benzo(a)pyrene	ND	1820	1200	66		-	-		40-140	-		30
Benzo(b)fluoranthene	ND	1820	1100	60		-	-		40-140	-		30
Benzo(k)fluoranthene	ND	1820	1000	55		-	-		40-140	-		30
Chrysene	ND	1820	1100	60		-	-		40-140	-		30
Acenaphthylene	ND	1820	1200	66		-	-		40-140	-		30
Anthracene	ND	1820	1100	60		-	-		40-140	-		30
Benzo(ghi)perylene	ND	1820	940	52		-	-		40-140	-		30
Fluorene	ND	1820	1000	55		-	-		40-140	-		30
Phenanthrene	ND	1820	1100	60		-	-		40-140	-		30
Dibenzo(a,h)anthracene	ND	1820	920	50		-	-		40-140	-		30
Indeno(1,2,3-cd)pyrene	ND	1820	980	54		-	-		40-140	-		30
Pyrene	140	1820	1300	71		-	-		40-140	-		30
2-Methylnaphthalene	ND	1820	1100	60		-	-		40-140	-		30

Surrogate	MS % Recovery	MS Qualifier	MSD % Recovery	MSD Qualifier	Acceptance Criteria
2-Fluorobiphenyl	58				30-130
4-Terphenyl-d14	51				30-130
Nitrobenzene-d5	58				30-130

Lab Duplicate Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2403791
Report Date: 01/25/24

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
MCP PAHs - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1877486-5 QC Sample: L2403791-02 Client ID: WRA-1-N						
Acenaphthene	ND	ND	ug/kg	NC		30
Fluoranthene	ND	250	ug/kg	NC		30
Naphthalene	ND	ND	ug/kg	NC		30
Benzo(a)anthracene	ND	190	ug/kg	NC		30
Benzo(a)pyrene	ND	190	ug/kg	NC		30
Benzo(b)fluoranthene	ND	210	ug/kg	NC		30
Benzo(k)fluoranthene	ND	ND	ug/kg	NC		30
Chrysene	ND	180	ug/kg	NC		30
Acenaphthylene	ND	ND	ug/kg	NC		30
Anthracene	ND	ND	ug/kg	NC		30
Benzo(ghi)perylene	ND	ND	ug/kg	NC		30
Fluorene	ND	ND	ug/kg	NC		30
Phenanthrene	ND	140	ug/kg	NC		30
Dibenzo(a,h)anthracene	ND	ND	ug/kg	NC		30
Indeno(1,2,3-cd)pyrene	ND	ND	ug/kg	NC		30
Pyrene	140	340	ug/kg	**83**	Q	30
2-Methylnaphthalene	ND	ND	ug/kg	NC		30

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	71		71		30-130
2-Fluorobiphenyl	75		71		30-130

Lab Duplicate Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2403791
Report Date: 01/25/24

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits

MCP PAHs - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1877486-5 QC Sample: L2403791-02 Client ID: WRA-1-N

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
4-Terphenyl-d14	74		60		30-130

PETROLEUM HYDROCARBONS

Project Name: LEDGE RD LANDFILL
Lab Number: L2403791
Project Number: 289302
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-01
Client ID: WRA-1-S
Sample Location: ANDOVER, MA

Date Collected: 01/22/24 11:30
Date Received: 01/23/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 1,8015D(M)
Analytical Date: 01/24/24 08:32
Analyst: LMR
Percent Solids: 54%

Extraction Method: EPA 3546
Extraction Date: 01/24/24 00:05

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C10-C36)	236000		ug/kg	59400	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	69		40-140

Project Name: LEDGE RD LANDFILL
Lab Number: L2403791
Project Number: 289302
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-02
Client ID: WRA-1-N
Sample Location: ANDOVER, MA

Date Collected: 01/23/24 08:00
Date Received: 01/23/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 1,8015D(M)
Analytical Date: 01/24/24 08:07
Analyst: LMR
Percent Solids: 72%

Extraction Method: EPA 3546
Extraction Date: 01/24/24 00:05

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C10-C36)	ND		ug/kg	44600	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	63		40-140

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2403791
Report Date: 01/25/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015D(M)
Analytical Date: 01/24/24 08:32
Analyst: LMR

Extraction Method: EPA 3546
Extraction Date: 01/24/24 00:05

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbon Quantitation - Westborough Lab for sample(s): 01-02 Batch: WG1877501-1					
TPH (C10-C36)	ND		ug/kg	31800	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	65		40-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2403791

Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 01-02 Batch: WG1877501-2								
TPH (C10-C36)	94		-		40-140	-		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
o-Terphenyl	84				40-140

Lab Duplicate Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2403791
Report Date: 01/25/24

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1877501-3 QC Sample: L2403791-01 Client ID: WRA-1-S						
TPH (C10-C36)	236000	180000	ug/kg	27		40

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	69		84		40-140

PCBS

Project Name: LEDGE RD LANDFILL
Lab Number: L2403791
Project Number: 289302
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-01
Client ID: WRA-1-S
Sample Location: ANDOVER, MA

Date Collected: 01/22/24 11:30
Date Received: 01/23/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8082A
Analytical Date: 01/24/24 08:56
Analyst: MEO
Percent Solids: 54%

Extraction Method: EPA 3546
Extraction Date: 01/23/24 23:52
Cleanup Method: EPA 3665A
Cleanup Date: 01/24/24
Cleanup Method: EPA 3660B
Cleanup Date: 01/24/24

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	92.5	--	1	A
Aroclor 1221	ND		ug/kg	92.5	--	1	A
Aroclor 1232	ND		ug/kg	92.5	--	1	A
Aroclor 1242	ND		ug/kg	92.5	--	1	A
Aroclor 1248	ND		ug/kg	92.5	--	1	A
Aroclor 1254	ND		ug/kg	92.5	--	1	A
Aroclor 1260	ND		ug/kg	92.5	--	1	A
Aroclor 1262	ND		ug/kg	92.5	--	1	A
Aroclor 1268	ND		ug/kg	92.5	--	1	A
PCBs, Total	ND		ug/kg	92.5	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	62		30-150	A
Decachlorobiphenyl	82		30-150	A
2,4,5,6-Tetrachloro-m-xylene	74		30-150	B
Decachlorobiphenyl	78		30-150	B

Project Name: LEDGE RD LANDFILL
Lab Number: L2403791
Project Number: 289302
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-02
Client ID: WRA-1-N
Sample Location: ANDOVER, MA

Date Collected: 01/23/24 08:00
Date Received: 01/23/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8082A
Analytical Date: 01/24/24 09:06
Analyst: MEO
Percent Solids: 72%

Extraction Method: EPA 3546
Extraction Date: 01/23/24 23:52
Cleanup Method: EPA 3665A
Cleanup Date: 01/24/24
Cleanup Method: EPA 3660B
Cleanup Date: 01/24/24

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	67.2	--	1	A
Aroclor 1221	ND		ug/kg	67.2	--	1	A
Aroclor 1232	ND		ug/kg	67.2	--	1	A
Aroclor 1242	ND		ug/kg	67.2	--	1	A
Aroclor 1248	ND		ug/kg	67.2	--	1	B
Aroclor 1254	ND		ug/kg	67.2	--	1	B
Aroclor 1260	ND		ug/kg	67.2	--	1	A
Aroclor 1262	ND		ug/kg	67.2	--	1	A
Aroclor 1268	ND		ug/kg	67.2	--	1	A
PCBs, Total	ND		ug/kg	67.2	--	1	B

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	67		30-150	A
Decachlorobiphenyl	81		30-150	A
2,4,5,6-Tetrachloro-m-xylene	74		30-150	B
Decachlorobiphenyl	75		30-150	B

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2403791
Report Date: 01/25/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082A
Analytical Date: 01/24/24 08:26
Analyst: MEO

Extraction Method: EPA 3546
Extraction Date: 01/23/24 23:52
Cleanup Method: EPA 3665A
Cleanup Date: 01/24/24
Cleanup Method: EPA 3660B
Cleanup Date: 01/24/24

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01-02 Batch: WG1877500-1						
Aroclor 1016	ND		ug/kg	48.7	--	A
Aroclor 1221	ND		ug/kg	48.7	--	A
Aroclor 1232	ND		ug/kg	48.7	--	A
Aroclor 1242	ND		ug/kg	48.7	--	A
Aroclor 1248	ND		ug/kg	48.7	--	A
Aroclor 1254	ND		ug/kg	48.7	--	A
Aroclor 1260	ND		ug/kg	48.7	--	A
Aroclor 1262	ND		ug/kg	48.7	--	A
Aroclor 1268	ND		ug/kg	48.7	--	A
PCBs, Total	ND		ug/kg	48.7	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	75		30-150	A
Decachlorobiphenyl	87		30-150	A
2,4,5,6-Tetrachloro-m-xylene	84		30-150	B
Decachlorobiphenyl	79		30-150	B

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2403791
Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01-02 Batch: WG1877500-2 WG1877500-3									
Aroclor 1016	74		69		40-140	7		30	A
Aroclor 1260	78		73		40-140	7		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	79		72		30-150	A
Decachlorobiphenyl	90		83		30-150	A
2,4,5,6-Tetrachloro-m-xylene	88		80		30-150	B
Decachlorobiphenyl	81		73		30-150	B

METALS

Project Name: LEDGE RD LANDFILL
Lab Number: L2403791
Project Number: 289302
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-01
Client ID: WRA-1-S
Sample Location: ANDOVER, MA
Date Collected: 01/22/24 11:30
Date Received: 01/23/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 54%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	26.6		mg/kg	3.63	--	1	01/24/24 07:25	01/24/24 09:50	EPA 3050B	97,6010D	DHL
Arsenic, Total	16.5		mg/kg	0.727	--	1	01/24/24 07:25	01/24/24 09:50	EPA 3050B	97,6010D	DHL
Barium, Total	496		mg/kg	0.727	--	1	01/24/24 07:25	01/24/24 09:50	EPA 3050B	97,6010D	DHL
Beryllium, Total	0.444		mg/kg	0.363	--	1	01/24/24 07:25	01/24/24 09:50	EPA 3050B	97,6010D	DHL
Cadmium, Total	3.34		mg/kg	0.727	--	1	01/24/24 07:25	01/24/24 09:50	EPA 3050B	97,6010D	DHL
Chromium, Total	23.6		mg/kg	0.727	--	1	01/24/24 07:25	01/24/24 09:50	EPA 3050B	97,6010D	DHL
Lead, Total	798		mg/kg	3.63	--	1	01/24/24 07:25	01/24/24 09:50	EPA 3050B	97,6010D	DHL
Mercury, Total	ND		mg/kg	0.142	--	1	01/24/24 07:55	01/24/24 10:31	EPA 7471B	97,7471B	GMG
Nickel, Total	22.1		mg/kg	1.82	--	1	01/24/24 07:25	01/24/24 09:50	EPA 3050B	97,6010D	DHL
Selenium, Total	ND		mg/kg	3.63	--	1	01/24/24 07:25	01/24/24 09:50	EPA 3050B	97,6010D	DHL
Silver, Total	0.872		mg/kg	0.727	--	1	01/24/24 07:25	01/24/24 09:50	EPA 3050B	97,6010D	DHL
Thallium, Total	ND		mg/kg	3.63	--	1	01/24/24 07:25	01/24/24 09:50	EPA 3050B	97,6010D	DHL
Vanadium, Total	27.1		mg/kg	0.727	--	1	01/24/24 07:25	01/24/24 09:50	EPA 3050B	97,6010D	DHL
Zinc, Total	3040		mg/kg	36.3	--	10	01/24/24 07:25	01/24/24 12:19	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2403791
Project Number: 289302
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-02
Client ID: WRA-1-N
Sample Location: ANDOVER, MA
Date Collected: 01/23/24 08:00
Date Received: 01/23/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 72%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	4.05		mg/kg	2.73	--	1	01/24/24 07:25	01/24/24 09:53	EPA 3050B	97,6010D	DHL
Arsenic, Total	9.07		mg/kg	0.545	--	1	01/24/24 07:25	01/24/24 09:53	EPA 3050B	97,6010D	DHL
Barium, Total	72.7		mg/kg	0.545	--	1	01/24/24 07:25	01/24/24 09:53	EPA 3050B	97,6010D	DHL
Beryllium, Total	0.311		mg/kg	0.273	--	1	01/24/24 07:25	01/24/24 09:53	EPA 3050B	97,6010D	DHL
Cadmium, Total	3.63		mg/kg	0.545	--	1	01/24/24 07:25	01/24/24 09:53	EPA 3050B	97,6010D	DHL
Chromium, Total	18.8		mg/kg	0.545	--	1	01/24/24 07:25	01/24/24 09:53	EPA 3050B	97,6010D	DHL
Lead, Total	96.3		mg/kg	2.73	--	1	01/24/24 07:25	01/24/24 09:53	EPA 3050B	97,6010D	DHL
Mercury, Total	ND		mg/kg	0.095	--	1	01/24/24 07:55	01/24/24 10:34	EPA 7471B	97,7471B	GMG
Nickel, Total	15.0		mg/kg	1.36	--	1	01/24/24 07:25	01/24/24 09:53	EPA 3050B	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.73	--	1	01/24/24 07:25	01/24/24 09:53	EPA 3050B	97,6010D	DHL
Silver, Total	ND		mg/kg	0.545	--	1	01/24/24 07:25	01/24/24 09:53	EPA 3050B	97,6010D	DHL
Thallium, Total	ND		mg/kg	2.73	--	1	01/24/24 07:25	01/24/24 09:53	EPA 3050B	97,6010D	DHL
Vanadium, Total	12.9		mg/kg	0.545	--	1	01/24/24 07:25	01/24/24 09:53	EPA 3050B	97,6010D	DHL
Zinc, Total	1390		mg/kg	27.3	--	10	01/24/24 07:25	01/24/24 12:22	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL **Lab Number:** L2403791

Project Number: 289302 **Report Date:** 01/25/24

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-02 Batch: WG1877548-1										
Mercury, Total	ND		mg/kg	0.083	--	1	01/24/24 07:55	01/24/24 10:01	97,7471B	GMG

Prep Information

Digestion Method: EPA 7471B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-02 Batch: WG1877549-1										
Antimony, Total	ND		mg/kg	2.00	--	1	01/24/24 07:25	01/24/24 09:27	97,6010D	DHL
Arsenic, Total	ND		mg/kg	0.400	--	1	01/24/24 07:25	01/24/24 09:27	97,6010D	DHL
Barium, Total	ND		mg/kg	0.400	--	1	01/24/24 07:25	01/24/24 09:27	97,6010D	DHL
Beryllium, Total	ND		mg/kg	0.200	--	1	01/24/24 07:25	01/24/24 09:27	97,6010D	DHL
Cadmium, Total	ND		mg/kg	0.400	--	1	01/24/24 07:25	01/24/24 09:27	97,6010D	DHL
Chromium, Total	ND		mg/kg	0.400	--	1	01/24/24 07:25	01/24/24 09:27	97,6010D	DHL
Lead, Total	ND		mg/kg	2.00	--	1	01/24/24 07:25	01/24/24 09:27	97,6010D	DHL
Nickel, Total	ND		mg/kg	1.00	--	1	01/24/24 07:25	01/24/24 09:27	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.00	--	1	01/24/24 07:25	01/24/24 09:27	97,6010D	DHL
Silver, Total	ND		mg/kg	0.400	--	1	01/24/24 07:25	01/24/24 09:27	97,6010D	DHL
Thallium, Total	ND		mg/kg	2.00	--	1	01/24/24 07:25	01/24/24 09:27	97,6010D	DHL
Vanadium, Total	ND		mg/kg	0.400	--	1	01/24/24 07:25	01/24/24 09:27	97,6010D	DHL
Zinc, Total	ND		mg/kg	2.00	--	1	01/24/24 07:25	01/24/24 09:27	97,6010D	DHL

Prep Information

Digestion Method: EPA 3050B

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2403791

Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1877548-2 WG1877548-3 SRM Lot Number: D122-540								
Mercury, Total	98		102		73-127	4		30
MCP Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1877549-2 WG1877549-3 SRM Lot Number: D122-540								
Antimony, Total	182		171		6-194	6		30
Arsenic, Total	117		109		81-119	7		30
Barium, Total	105		101		83-117	4		30
Beryllium, Total	109		104		83-117	5		30
Cadmium, Total	107		100		83-117	7		30
Chromium, Total	108		101		82-118	7		30
Lead, Total	115		108		83-117	6		30
Nickel, Total	109		101		83-117	8		30
Selenium, Total	117		108		81-119	8		30
Silver, Total	112		105		80-120	6		30
Thallium, Total	116		110		81-119	5		30
Vanadium, Total	105		99		80-120	6		30
Zinc, Total	108		98		82-119	10		30

INORGANICS
&
MISCELLANEOUS

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2403791
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-01
Client ID: WRA-1-S
Sample Location: ANDOVER, MA

Date Collected: 01/22/24 11:30
Date Received: 01/23/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	53.7		%	0.100	NA	1	-	01/23/24 23:24	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2403791
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-02
Client ID: WRA-1-N
Sample Location: ANDOVER, MA

Date Collected: 01/23/24 08:00
Date Received: 01/23/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	71.9		%	0.100	NA	1	-	01/23/24 23:24	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2403791
Report Date: 01/25/24

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2403791-01A	Vial MeOH preserved	A	NA		3.6	Y	Absent		MCP-8260HLW-21(14)
L2403791-01B	Vial water preserved	A	NA		3.6	Y	Absent	23-JAN-24 21:02	MCP-8260HLW-21(14)
L2403791-01C	Vial water preserved	A	NA		3.6	Y	Absent	23-JAN-24 21:02	MCP-8260HLW-21(14)
L2403791-01D	Plastic 2oz unpreserved for TS	A	NA		3.6	Y	Absent		TS(7)
L2403791-01E	Metals Only-Glass 60mL/2oz unpreserved	A	NA		3.6	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-CD-6010T-10(180),MCP-7471T-10(28),MCP-TL-6010T-10(180),MCP-ZN-6010T-10(180),MCP-SB-6010T-10(180),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L2403791-01F	Glass 250ml/8oz unpreserved	A	NA		3.6	Y	Absent		MCP-8082-10(365),MCP-PAH-21(14),TPH-DRO-D(14)
L2403791-02A	Vial MeOH preserved	A	NA		3.6	Y	Absent		MCP-8260HLW-21(14)
L2403791-02B	Vial water preserved	A	NA		3.6	Y	Absent	23-JAN-24 21:02	MCP-8260HLW-21(14)
L2403791-02C	Vial water preserved	A	NA		3.6	Y	Absent	23-JAN-24 21:02	MCP-8260HLW-21(14)
L2403791-02D	Plastic 2oz unpreserved for TS	A	NA		3.6	Y	Absent		TS(7)
L2403791-02E	Metals Only-Glass 60mL/2oz unpreserved	A	NA		3.6	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-CD-6010T-10(180),MCP-TL-6010T-10(180),MCP-7471T-10(28),MCP-ZN-6010T-10(180),MCP-SB-6010T-10(180),MCP-AG-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L2403791-02F	Glass 250ml/8oz unpreserved	A	NA		3.6	Y	Absent		MCP-8082-10(365),MCP-PAH-21(14),TPH-DRO-D(14)

*Values in parentheses indicate holding time in days

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2403791
Project Number:	289302	**Report Date:**	01/25/24

GLOSSARY

Acronyms

DL - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EMPC - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LOD - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

LOQ - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

NR - No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TEF - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.

TEQ - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2403791
Project Number:	289302	**Report Date:**	01/25/24

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2403791
Project Number:	289302	**Report Date:**	01/25/24

Data Qualifiers

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2403791
Project Number:	289302	**Report Date:**	01/25/24

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010 and WSC-CAM-IIIA and IIID, January 2024.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

141 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA and IIB, November 2021.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE _____ OF _____

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 1/23/24

ALPHA Job #: L2403791

Client Information

Client: CDM Smith
Address: 75 State Street, Suite 701
Boston, MA 02109
Phone: 617-452-6563
Fax:
Email: JonesNE@cdmsmith.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Ledge Rd Landfill
Project Location: Andover, MA
Project #: 289302
Project Manager: Nathan Jones
ALPHA Quote #:

Turn-Around Time

☐ Standard ☒ RUSH (only confirmed if pre-approved)
Date Due: Time:

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program: MassDEP Criteria: RCS-1 Soil Standards

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

☒ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☒ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

Detection limits for each parameter shall be less than reportable concentrations for RCS-1 criteria

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	VOCs - EPA 8260	MCP-14 Metals - EPA 6010/7000	PAHs - EPA 8270	TPH - MassDEP Method	PCBs - EPA 8082	Sample Specific Comments	TOTAL # BOTTLES
03741-01	WRA-1-MS	1/22/24	11:30	SO	ET	X	X	X	X	X		
02	WRA-1-SN	1/23/24	8:00	SO	ET	X	X	X	X	X		

SAMPLE HANDLING
Filtration
☐ Done ☒ Not needed ☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP *or* CT RCP?

Container Type														
Preservative														

Relinquished By:	Date/Time	Received By:	Date/Time
CDMSmith	1/23/24 15:30		1-23-24 15:10
	1.23.24 19:30		1/23/24 1930

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

(ORIGINAL) (Rev. 1 (Jan-2010))

Method Blank Summary
Form 4
Volatiles

Client	: CDM Smith, Inc.	**Lab Number**	: L2403791
Project Name	: LEDGE RD LANDFILL	**Project Number**	: 289302
Lab Sample ID	: WG1877777-5	**Lab File ID**	: V29240124A05
Instrument ID	: VOA129		
Matrix	: SOIL	**Analysis Date**	: 01/24/24 09:03

Client Sample No.	Lab Sample ID	Analysis Date
WG1877777-3LCS	WG1877777-3	01/24/24 07:40
WG1877777-4LCSD	WG1877777-4	01/24/24 08:01
WRA-1-N	L2403791-02	01/24/24 11:36

Method Blank Summary
Form 4
Volatiles

Client	: CDM Smith, Inc.	**Lab Number**	: L2403791
Project Name	: LEDGE RD LANDFILL	**Project Number**	: 289302
Lab Sample ID	: WG1878014-5	**Lab File ID**	: V29240124N05
Instrument ID	: VOA129		
Matrix	: SOIL	**Analysis Date**	: 01/24/24 19:34

Client Sample No.	Lab Sample ID	Analysis Date
WG1878014-3LCS	WG1878014-3	01/24/24 18:11
WG1878014-4LCSD	WG1878014-4	01/24/24 18:32
WRA-1-S	L2403791-01	01/24/24 23:43

Calibration Verification Summary
Form 7
Volatiles

Client	: CDM Smith, Inc.	**Lab Number**	: L2403791
Project Name	: LEDGE RD LANDFILL	**Project Number**	: 289302
Instrument ID	: VOA129	**Calibration Date**	: 01/24/24 07:40
Lab File ID	: V29240124A01	**Init. Calib. Date(s)**	: 12/19/23 12/20/23
Sample No	: WG1877777-2	**Init. Calib. Times**	: 21:48 01:16
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
Fluorobenzene	1	1	-	0	20	80	0
Dichlorodifluoromethane	0.332	0.202	-	39.2*	20	46	0
Chloromethane	0.42	0.418	-	0.5	20	75	0
Vinyl chloride	0.377	0.336	-	10.9	20	67	0
Bromomethane	0.185	0.171	-	7.6	20	78	0
Chloroethane	0.206	0.199	-	3.4	20	72	0
Trichlorofluoromethane	0.367	0.3	-	18.3	20	61	0
Ethyl ether	0.13	0.112	-	13.8	20	66	0
1,1-Dichloroethene	0.225	0.19	-	15.6	20	64	0
Carbon disulfide	0.786	0.68	-	13.5	20	65	0
Methylene chloride	40	34.465	-	13.8	20	66	0
Acetone	40	25.193	-	37*	20	56	0
trans-1,2-Dichloroethene	0.255	0.218	-	14.5	20	65	0
Methyl tert-butyl ether	0.671	0.578	-	13.9	20	63	0
Diisopropyl ether	1.023	1.068	-	-4.4	20	76	0
1,1-Dichloroethane	0.563	0.516	-	8.3	20	70	0
Ethyl tert-butyl ether	0.907	0.845	-	6.8	20	67	0
cis-1,2-Dichloroethene	0.289	0.243	-	15.9	20	63	0
2,2-Dichloropropane	0.35	0.298	-	14.9	20	65	0
Bromochloromethane	0.134	0.106	-	20.9*	20	61	0
Chloroform	0.485	0.423	-	12.8	20	66	0
Carbon tetrachloride	0.313	0.282	-	9.9	20	66	0
Tetrahydrofuran	0.112	0.078	-	30.4*	20	57	0
Dibromofluoromethane	0.252	0.243	-	3.6	20	77	0
1,1,1-Trichloroethane	0.381	0.348	-	8.7	20	64	0
2-Butanone	0.151	0.106	-	29.8*	20	57	0
1,1-Dichloropropene	0.343	0.324	-	5.5	20	66	0
Benzene	0.99	0.915	-	7.6	20	67	0
tert-Amyl methyl ether	0.633	0.512	-	19.1	20	59	0
1,2-Dichloroethane-d4	0.321	0.327	-	-1.9	20	83	0
1,2-Dichloroethane	0.417	0.366	-	12.2	20	66	0
Trichloroethene	0.26	0.243	-	6.5	20	66	0
Dibromomethane	0.162	0.128	-	21*	20	60	0
1,2-Dichloropropane	0.306	0.288	-	5.9	20	69	0
Bromodichloromethane	0.336	0.301	-	10.4	20	65	0
1,4-Dioxane	0.00323	0.00197*	-	39*	20	48	0
cis-1,3-Dichloropropene	0.366	0.324	-	11.5	20	61	0
Chlorobenzene-d5	1	1	-	0	20	78	0
Toluene-d8	1.302	1.36	-	-4.5	20	81	0
Toluene	0.875	0.79	-	9.7	20	66	0
4-Methyl-2-pentanone	0.155	0.115	-	25.8*	20	53	0
Tetrachloroethene	0.338	0.308	-	8.9	20	63	0
trans-1,3-Dichloropropene	0.445	0.381	-	14.4	20	61	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: CDM Smith, Inc.	**Lab Number**	: L2403791
Project Name	: LEDGE RD LANDFILL	**Project Number**	: 289302
Instrument ID	: VOA129	**Calibration Date**	: 01/24/24 07:40
Lab File ID	: V29240124A01	**Init. Calib. Date(s)**	: 12/19/23 12/20/23
Sample No	: WG1877777-2	**Init. Calib. Times**	: 21:48 01:16
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
1,1,2-Trichloroethane	0.248	0.217	-	12.5	20	63	0
Chlorodibromomethane	0.307	0.264	-	14	20	59	0
1,3-Dichloropropane	0.508	0.443	-	12.8	20	62	0
1,2-Dibromoethane	0.274	0.234	-	14.6	20	60	0
2-Hexanone	0.275	0.206	-	25.1*	20	55	0
Chlorobenzene	0.945	0.859	-	9.1	20	65	0
Ethylbenzene	1.663	1.559	-	6.3	20	68	0
1,1,1,2-Tetrachloroethane	40	32.226	-	19.4	20	62	0
p/m Xylene	0.625	0.579	-	7.4	20	66	0
o Xylene	0.606	0.559	-	7.8	20	66	0
Styrene	0.997	0.935	-	6.2	20	65	0
1,4-Dichlorobenzene-d4	1	1	-	0	20	80	0
Bromoform	0.388	0.294	-	24.2*	20	55	0
Isopropylbenzene	3.156	2.969	-	5.9	20	67	0
4-Bromofluorobenzene	0.963	0.97	-	-0.7	20	79	0
Bromobenzene	0.786	0.665	-	15.4	20	62	0
n-Propylbenzene	3.818	3.697	-	3.2	20	69	0
1,1,2,2-Tetrachloroethane	0.713	0.576	-	19.2	20	57	0
2-Chlorotoluene	2.37	2.492	-	-5.1	20	77	0
1,3,5-Trimethylbenzene	2.79	2.624	-	5.9	20	67	0
1,2,3-Trichloropropane	0.642	0.507	-	21*	20	58	0
4-Chlorotoluene	2.434	2.244	-	7.8	20	67	0
tert-Butylbenzene	2.31	2.121	-	8.2	20	66	0
1,2,4-Trimethylbenzene	2.69	2.513	-	6.6	20	67	0
sec-Butylbenzene	3.438	3.255	-	5.3	20	67	0
p-Isopropyltoluene	2.933	2.814	-	4.1	20	68	0
1,3-Dichlorobenzene	1.526	1.346	-	11.8	20	64	0
1,4-Dichlorobenzene	1.552	1.36	-	12.4	20	65	0
n-Butylbenzene	2.679	2.695	-	-0.6	20	71	0
1,2-Dichlorobenzene	1.438	1.246	-	13.4	20	64	0
1,2-Dibromo-3-chloropropan	0.115	0.08	-	30.4*	20	54	0
Hexachlorobutadiene	0.554	0.465	-	16.1	20	61	0
1,2,4-Trichlorobenzene	1.012	0.923	-	8.8	20	66	0
Naphthalene	2.453	1.972	-	19.6	20	59	0
1,2,3-Trichlorobenzene	0.973	0.839	-	13.8	20	64	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: CDM Smith, Inc.	**Lab Number**	: L2403791
Project Name	: LEDGE RD LANDFILL	**Project Number**	: 289302
Instrument ID	: VOA129	**Calibration Date**	: 01/24/24 18:11
Lab File ID	: V29240124N01	**Init. Calib. Date(s)**	: 12/19/23 12/20/23
Sample No	: WG1878014-2	**Init. Calib. Times**	: 21:48 01:16
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
Fluorobenzene	1	1	-	0	20	72	0
Dichlorodifluoromethane	0.332	0.253	-	23.8*	20	51	0
Chloromethane	0.42	0.463	-	-10.2	20	75	0
Vinyl chloride	0.377	0.374	-	0.8	20	68	0
Bromomethane	0.185	0.181	-	2.2	20	74	0
Chloroethane	0.206	0.215	-	-4.4	20	70	0
Trichlorofluoromethane	0.367	0.343	-	6.5	20	63	0
Ethyl ether	0.13	0.116	-	10.8	20	62	0
1,1-Dichloroethene	0.225	0.206	-	8.4	20	63	0
Carbon disulfide	0.786	0.718	-	8.7	20	62	0
Freon-113	0.237	0.218	-	8	20	60	0
Acrolein	40	30.425	-	23.9*	20	56	0
Methylene chloride	40	35.742	-	10.6	20	61	0
Acetone	40	29.158	-	27.1*	20	57	0
trans-1,2-Dichloroethene	0.255	0.23	-	9.8	20	62	0
Methyl acetate	0.254	0.196	-	22.8*	20	59	0
Methyl tert-butyl ether	0.671	0.572	-	14.8	20	57	-.01
tert-Butyl alcohol	0.045	0.027	-	40*	20	47	-.02
Diisopropyl ether	1.023	1.139	-	-11.3	20	73	0
1,1-Dichloroethane	0.563	0.545	-	3.2	20	67	0
Halothane	0.193	0.175	-	9.3	20	62	0
Acrylonitrile	0.108	0.084	-	22.2*	20	57	0
Ethyl tert-butyl ether	0.907	0.84	-	7.4	20	60	-.01
Vinyl acetate	0.658	0.603	-	8.4	20	62	0
cis-1,2-Dichloroethene	0.289	0.256	-	11.4	20	60	0
2,2-Dichloropropane	0.35	0.304	-	13.1	20	60	-.01
Bromochloromethane	0.134	0.109	-	18.7	20	57	0
Cyclohexane	0.555	0.579	-	-4.3	20	67	0
Chloroform	0.485	0.442	-	8.9	20	62	0
Ethyl acetate	0.302	0.248	-	17.9	20	57	0
Carbon tetrachloride	0.313	0.3	-	4.2	20	63	0
Tetrahydrofuran	0.112	0.084	-	25*	20	55	0
Dibromofluoromethane	0.252	0.25	-	0.8	20	71	0
1,1,1-Trichloroethane	0.381	0.364	-	4.5	20	61	0
2-Butanone	0.151	0.113	-	25.2*	20	55	0
1,1-Dichloropropene	0.343	0.34	-	0.9	20	63	0
Benzene	0.99	0.954	-	3.6	20	63	0
tert-Amyl methyl ether	0.633	0.5	-	21*	20	52	0
1,2-Dichloroethane-d4	0.321	0.328	-	-2.2	20	75	0
1,2-Dichloroethane	0.417	0.377	-	9.6	20	62	0
Methyl cyclohexane	0.428	0.408	-	4.7	20	61	0
Trichloroethene	0.26	0.259	-	0.4	20	63	0
Dibromomethane	0.162	0.133	-	17.9	20	57	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: CDM Smith, Inc.		**Lab Number**	: L2403791	
Project Name	: LEDGE RD LANDFILL		**Project Number**	: 289302	
Instrument ID	: VOA129		**Calibration Date**	: 01/24/24 18:11	
Lab File ID	: V29240124N01		**Init. Calib. Date(s)**	: 12/19/23	12/20/23
Sample No	: WG1878014-2		**Init. Calib. Times**	: 21:48	01:16
Channel	:				

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
1,2-Dichloropropane	0.306	0.3	-	2	20	65	0
2-Chloroethyl vinyl ether	0.184	0.145	-	21.2*	20	53	-.02
Bromodichloromethane	0.336	0.315	-	6.3	20	61	0
1,4-Dioxane	0.00323	0.00195*	-	39.6*	20	43	0
cis-1,3-Dichloropropene	0.366	0.335	-	8.5	20	57	0
Chlorobenzene-d5	1	1	-	0	20	70	0
Toluene-d8	1.302	1.387	-	-6.5	20	74	0
Toluene	0.875	0.832	-	4.9	20	62	0
4-Methyl-2-pentanone	0.155	0.115	-	25.8*	20	47	0
Tetrachloroethene	0.338	0.322	-	4.7	20	59	0
trans-1,3-Dichloropropene	0.445	0.39	-	12.4	20	56	0
Ethyl methacrylate	0.351	0.288	-	17.9	20	52	0
1,1,2-Trichloroethane	0.248	0.222	-	10.5	20	58	0
Chlorodibromomethane	0.307	0.28	-	8.8	20	56	0
1,3-Dichloropropane	0.508	0.454	-	10.6	20	57	0
1,2-Dibromoethane	0.274	0.237	-	13.5	20	54	0
2-Hexanone	0.275	0.215	-	21.8*	20	51	0
Chlorobenzene	0.945	0.898	-	5	20	61	0
Ethylbenzene	1.663	1.627	-	2.2	20	63	0
1,1,1,2-Tetrachloroethane	40	33.5	-	16.3	20	58	0
p/m Xylene	0.625	0.612	-	2.1	20	62	0
o Xylene	0.606	0.589	-	2.8	20	62	0
Styrene	0.997	0.978	-	1.9	20	60	0
1,4-Dichlorobenzene-d4	1	1	-	0	20	71	0
Bromoform	0.388	0.306	-	21.1*	20	52	0
Isopropylbenzene	3.156	3.071	-	2.7	20	62	0
4-Bromofluorobenzene	0.963	0.963	-	0	20	71	0
Bromobenzene	0.786	0.676	-	14	20	56	0
n-Propylbenzene	3.818	3.821	-	-0.1	20	64	0
1,4-Dichlorobutane	1.245	1.154	-	7.3	20	61	0
1,1,2,2-Tetrachloroethane	0.713	0.595	-	16.5	20	53	0
4-Ethyltoluene	3.149	3.118	-	1	20	63	0
2-Chlorotoluene	2.37	2.284	-	3.6	20	63	0
1,3,5-Trimethylbenzene	2.79	2.719	-	2.5	20	62	0
1,2,3-Trichloropropane	0.642	0.514	-	19.9	20	53	0
trans-1,4-Dichloro-2-buten	0.263	0.229	-	12.9	20	60	0
4-Chlorotoluene	2.434	2.354	-	3.3	20	63	0
tert-Butylbenzene	2.31	2.232	-	3.4	20	62	0
1,2,4-Trimethylbenzene	2.69	2.613	-	2.9	20	62	0
sec-Butylbenzene	3.438	3.466	-	-0.8	20	64	0
p-Isopropyltoluene	2.933	2.908	-	0.9	20	63	0
1,3-Dichlorobenzene	1.526	1.411	-	7.5	20	60	0
1,4-Dichlorobenzene	1.552	1.404	-	9.5	20	60	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: CDM Smith, Inc.		**Lab Number**	: L2403791	
Project Name	: LEDGE RD LANDFILL		**Project Number**	: 289302	
Instrument ID	: VOA129		**Calibration Date**	: 01/24/24 18:11	
Lab File ID	: V29240124N01		**Init. Calib. Date(s)**	: 12/19/23	12/20/23
Sample No	: WG1878014-2		**Init. Calib. Times**	: 21:48	01:16
Channel	:				

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
p-Diethylbenzene	1.805	1.785	-	1.1	20	63	0
n-Butylbenzene	2.679	2.831	-	-5.7	20	67	0
1,2-Dichlorobenzene	1.438	1.273	-	11.5	20	59	0
1,2,4,5-Tetramethylbenzene	2.739	2.644	-	3.5	20	61	0
1,2-Dibromo-3-chloropropan	0.115	0.078	-	32.2*	20	47	0
1,3,5-Trichlorobenzene	1.142	1.077	-	5.7	20	63	0
Hexachlorobutadiene	0.554	0.477	-	13.9	20	56	0
1,2,4-Trichlorobenzene	1.012	0.934	-	7.7	20	60	0
Naphthalene	2.453	1.912	-	22.1*	20	51	0
1,2,3-Trichlorobenzene	0.973	0.842	-	13.5	20	58	0

* Value outside of QC limits.

ANALYTICAL REPORT

Lab Number:	L2406353
Client:	CDM Smith, Inc. 75 State Street Suite 701 Boston, MA 02109
ATTN:	Nathan Jones
Phone:	(617) 452-6563
Project Name:	LEDGE RD LANDFILL
Project Number:	289302
Report Date:	02/08/24

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Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2406353-01	WRA-2	SOIL	ANDOVER, MA	02/05/24 09:55	02/06/24
L2406353-02	WRA-1-S-2	SOIL	ANDOVER, MA	02/05/24 11:35	02/06/24
L2406353-03	WRA-1-S-1	SOIL	ANDOVER, MA	02/05/24 11:45	02/06/24
L2406353-04	WRA-1-N-5	SOIL	ANDOVER, MA	02/05/24 11:55	02/06/24
L2406353-05	WRA-1-N-4	SOIL	ANDOVER, MA	02/05/24 13:10	02/06/24
L2406353-06	WRA-1-N-3	SOIL	ANDOVER, MA	02/05/24 13:45	02/06/24
L2406353-07	WRA-1-N-2	SOIL	ANDOVER, MA	02/05/24 14:10	02/06/24
L2406353-08	WRA-1-N-1	SOIL	ANDOVER, MA	02/05/24 14:20	02/06/24
L2406353-09	WRA-1-S-5	SOIL	ANDOVER, MA	02/05/24 14:45	02/06/24
L2406353-10	WRA-1-S-3	SOIL	ANDOVER, MA	02/05/24 15:40	02/06/24
L2406353-11	WRA-1-S-4	SOIL	ANDOVER, MA	02/05/24 15:50	02/06/24

Project Name: LEDGE RD LANDFILL **Lab Number:** L2406353

Project Number: 289302 **Report Date:** 02/08/24

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	NO

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2406353
Project Number:	289302	**Report Date:**	02/08/24

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: LEDGE RD LANDFILL **Lab Number:** L2406353
Project Number: 289302 **Report Date:** 02/08/24

Case Narrative (continued)

MCP Related Narratives

Sample Receipt

In reference to question H:

A Matrix Spike was not submitted for the analysis of Total Metals.

Volatile Organics

L2406353-01: Initial calibration utilized a quadratic fit for: trans-1,3-dichloropropene, chlorodibromomethane, o-xylene, styrene, bromoform

In reference to question H:

L2406353-01: Initial Calibration did not meet:

Lowest Calibration Standard Minimum Response Factor: bromochloromethane (0.0875), 1,2-dichloropropane (0.1561), bromodichloromethane (0.2539), 1,4-dioxane (0.0008), cis-1,3-dichloropropene (0.2004), 1,1,2-trichloroethane (0.1315), 1,2-dibromoethane (0.1382)

Average Response Factor: 1,2-dichloropropane, bromodichloromethane, 1,4-dioxane, cis-1,3-dichloropropene, 1,1,2-trichloroethane, 1,2-dibromoethane

Verification: tetrahydrofuran (136%), 1,4-dioxane (132%)

L2406353-01: The associated continuing calibration standard is outside the acceptance criteria for several compounds; however, it is within overall method allowances. Associated results are considered to be biased high if the %D is negative and biased low if the %D is positive. A copy of the continuing calibration standard is included as an addendum to this report.

Semivolatile Organics

In reference to question I:

All samples were analyzed for a subset of MCP analytes per client request.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Kelly O'Neill

Title: Technical Director/Representative Date: 02/08/24

QC OUTLIER SUMMARY REPORT

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment
MCP Volatile Organics by EPA 5035 Low - Westborough Lab								
8260D	Batch QC	WG1882758-3	Bromomethane	LCS	67	70-130	01	potential low bias
8260D	Batch QC	WG1882758-3	Chloroethane	LCS	67	70-130	01	potential low bias
8260D	Batch QC	WG1882758-3	Diethyl ether	LCS	69	70-130	01	potential low bias
8260D	Batch QC	WG1882758-4	Trichlorofluoromethane	LCSD	61	70-130	01	potential low bias
8260D	Batch QC	WG1882758-4	Bromomethane	LCSD	60	70-130	01	potential low bias
8260D	Batch QC	WG1882758-4	Chloroethane	LCSD	58	70-130	01	potential low bias
8260D	Batch QC	WG1882758-4	1,1-Dichloroethene	LCSD	63	70-130	01	potential low bias
8260D	Batch QC	WG1882758-4	Carbon disulfide	LCSD	62	70-130	01	potential low bias
8260D	Batch QC	WG1882758-4	Diethyl ether	LCSD	62	70-130	01	potential low bias

ORGANICS

VOLATILES

Project Name: LEDGE RD LANDFILL **Lab Number:** L2406353

Project Number: 289302 **Report Date:** 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-01 Date Collected: 02/05/24 09:55
Client ID: WRA-2 Date Received: 02/06/24
Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8260D
Analytical Date: 02/07/24 11:40
Analyst: AJK
Percent Solids: 86%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Methylene chloride	ND		ug/kg	26	--	1
1,1-Dichloroethane	ND		ug/kg	5.2	--	1
Chloroform	ND		ug/kg	7.8	--	1
Carbon tetrachloride	ND		ug/kg	5.2	--	1
1,2-Dichloropropane	ND		ug/kg	5.2	--	1
Dibromochloromethane	ND		ug/kg	5.2	--	1
1,1,2-Trichloroethane	ND		ug/kg	5.2	--	1
Tetrachloroethene	ND		ug/kg	2.6	--	1
Chlorobenzene	ND		ug/kg	2.6	--	1
Trichlorofluoromethane	ND		ug/kg	21	--	1
1,2-Dichloroethane	ND		ug/kg	5.2	--	1
1,1,1-Trichloroethane	ND		ug/kg	2.6	--	1
Bromodichloromethane	ND		ug/kg	2.6	--	1
trans-1,3-Dichloropropene	ND		ug/kg	5.2	--	1
cis-1,3-Dichloropropene	ND		ug/kg	2.6	--	1
1,3-Dichloropropene, Total	ND		ug/kg	2.6	--	1
1,1-Dichloropropene	ND		ug/kg	2.6	--	1
Bromoform	ND		ug/kg	21	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	2.6	--	1
Benzene	ND		ug/kg	2.6	--	1
Toluene	ND		ug/kg	5.2	--	1
Ethylbenzene	ND		ug/kg	5.2	--	1
Chloromethane	ND		ug/kg	21	--	1
Bromomethane	ND		ug/kg	10	--	1
Vinyl chloride	ND		ug/kg	5.2	--	1
Chloroethane	ND		ug/kg	10	--	1
1,1-Dichloroethene	ND		ug/kg	5.2	--	1
trans-1,2-Dichloroethene	ND		ug/kg	7.8	--	1

Project Name: LEDGE RD LANDFILL **Lab Number:** L2406353

Project Number: 289302 **Report Date:** 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-01 Date Collected: 02/05/24 09:55

Client ID: WRA-2 Date Received: 02/06/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Trichloroethene	ND		ug/kg	2.6	--	1
1,2-Dichlorobenzene	ND		ug/kg	10	--	1
1,3-Dichlorobenzene	ND		ug/kg	10	--	1
1,4-Dichlorobenzene	ND		ug/kg	10	--	1
Methyl tert butyl ether	ND		ug/kg	10	--	1
p/m-Xylene	ND		ug/kg	10	--	1
o-Xylene	ND		ug/kg	5.2	--	1
Xylenes, Total	ND		ug/kg	5.2	--	1
cis-1,2-Dichloroethene	ND		ug/kg	5.2	--	1
1,2-Dichloroethene, Total	ND		ug/kg	5.2	--	1
Dibromomethane	ND		ug/kg	10	--	1
1,2,3-Trichloropropane	ND		ug/kg	10	--	1
Styrene	ND		ug/kg	5.2	--	1
Dichlorodifluoromethane	ND		ug/kg	52	--	1
Acetone	ND		ug/kg	130	--	1
Carbon disulfide	ND		ug/kg	52	--	1
Methyl ethyl ketone	ND		ug/kg	52	--	1
Methyl isobutyl ketone	ND		ug/kg	52	--	1
2-Hexanone	ND		ug/kg	52	--	1
Bromochloromethane	ND		ug/kg	10	--	1
Tetrahydrofuran	ND		ug/kg	21	--	1
2,2-Dichloropropane	ND		ug/kg	10	--	1
1,2-Dibromoethane	ND		ug/kg	5.2	--	1
1,3-Dichloropropane	ND		ug/kg	10	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	2.6	--	1
Bromobenzene	ND		ug/kg	10	--	1
n-Butylbenzene	ND		ug/kg	5.2	--	1
sec-Butylbenzene	ND		ug/kg	5.2	--	1
tert-Butylbenzene	ND		ug/kg	10	--	1
o-Chlorotoluene	ND		ug/kg	10	--	1
p-Chlorotoluene	ND		ug/kg	10	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	16	--	1
Hexachlorobutadiene	ND		ug/kg	21	--	1
Isopropylbenzene	ND		ug/kg	5.2	--	1
p-Isopropyltoluene	ND		ug/kg	5.2	--	1
Naphthalene	ND		ug/kg	21	--	1
n-Propylbenzene	ND		ug/kg	5.2	--	1

Project Name: LEDGE RD LANDFILL **Lab Number:** L2406353

Project Number: 289302 **Report Date:** 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-01 Date Collected: 02/05/24 09:55

Client ID: WRA-2 Date Received: 02/06/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	10	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	10	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	10	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	10	--	1
Diethyl ether	ND		ug/kg	10	--	1
Diisopropyl Ether	ND		ug/kg	10	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	10	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	10	--	1
1,4-Dioxane	ND		ug/kg	420	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	107		70-130
Toluene-d8	94		70-130
4-Bromofluorobenzene	94		70-130
Dibromofluoromethane	117		70-130

Project Name: LEDGE RD LANDFILL **Lab Number:** L2406353

Project Number: 289302 **Report Date:** 02/08/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 02/07/24 11:14
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1882758-5					
Methylene chloride	ND		ug/kg	5.0	--
1,1-Dichloroethane	ND		ug/kg	1.0	--
Chloroform	ND		ug/kg	1.5	--
Carbon tetrachloride	ND		ug/kg	1.0	--
1,2-Dichloropropane	ND		ug/kg	1.0	--
Dibromochloromethane	ND		ug/kg	1.0	--
1,1,2-Trichloroethane	ND		ug/kg	1.0	--
Tetrachloroethene	ND		ug/kg	0.50	--
Chlorobenzene	ND		ug/kg	0.50	--
Trichlorofluoromethane	ND		ug/kg	4.0	--
1,2-Dichloroethane	ND		ug/kg	1.0	--
1,1,1-Trichloroethane	ND		ug/kg	0.50	--
Bromodichloromethane	ND		ug/kg	0.50	--
trans-1,3-Dichloropropene	ND		ug/kg	1.0	--
cis-1,3-Dichloropropene	ND		ug/kg	0.50	--
1,3-Dichloropropene, Total	ND		ug/kg	0.50	--
1,1-Dichloropropene	ND		ug/kg	0.50	--
Bromoform	ND		ug/kg	4.0	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.50	--
Benzene	ND		ug/kg	0.50	--
Toluene	ND		ug/kg	1.0	--
Ethylbenzene	ND		ug/kg	1.0	--
Chloromethane	ND		ug/kg	4.0	--
Bromomethane	ND		ug/kg	2.0	--
Vinyl chloride	ND		ug/kg	1.0	--
Chloroethane	ND		ug/kg	2.0	--
1,1-Dichloroethene	ND		ug/kg	1.0	--
trans-1,2-Dichloroethene	ND		ug/kg	1.5	--
Trichloroethene	ND		ug/kg	0.50	--

Project Name: LEDGE RD LANDFILL **Lab Number:** L2406353

Project Number: 289302 **Report Date:** 02/08/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 02/07/24 11:14
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1882758-5					
1,2-Dichlorobenzene	ND		ug/kg	2.0	--
1,3-Dichlorobenzene	ND		ug/kg	2.0	--
1,4-Dichlorobenzene	ND		ug/kg	2.0	--
Methyl tert butyl ether	ND		ug/kg	2.0	--
p/m-Xylene	ND		ug/kg	2.0	--
o-Xylene	ND		ug/kg	1.0	--
Xylenes, Total	ND		ug/kg	1.0	--
cis-1,2-Dichloroethene	ND		ug/kg	1.0	--
1,2-Dichloroethene, Total	ND		ug/kg	1.0	--
Dibromomethane	ND		ug/kg	2.0	--
1,2,3-Trichloropropane	ND		ug/kg	2.0	--
Styrene	ND		ug/kg	1.0	--
Dichlorodifluoromethane	ND		ug/kg	10	--
Acetone	ND		ug/kg	25	--
Carbon disulfide	ND		ug/kg	10	--
Methyl ethyl ketone	ND		ug/kg	10	--
Methyl isobutyl ketone	ND		ug/kg	10	--
2-Hexanone	ND		ug/kg	10	--
Bromochloromethane	ND		ug/kg	2.0	--
Tetrahydrofuran	ND		ug/kg	4.0	--
2,2-Dichloropropane	ND		ug/kg	2.0	--
1,2-Dibromoethane	ND		ug/kg	1.0	--
1,3-Dichloropropane	ND		ug/kg	2.0	--
1,1,1,2-Tetrachloroethane	ND		ug/kg	0.50	--
Bromobenzene	ND		ug/kg	2.0	--
n-Butylbenzene	ND		ug/kg	1.0	--
sec-Butylbenzene	ND		ug/kg	1.0	--
tert-Butylbenzene	ND		ug/kg	2.0	--
o-Chlorotoluene	ND		ug/kg	2.0	--

Project Name: LEDGE RD LANDFILL **Lab Number:** L2406353

Project Number: 289302 **Report Date:** 02/08/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 02/07/24 11:14
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1882758-5					
p-Chlorotoluene	ND		ug/kg	2.0	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	3.0	--
Hexachlorobutadiene	ND		ug/kg	4.0	--
Isopropylbenzene	ND		ug/kg	1.0	--
p-Isopropyltoluene	ND		ug/kg	1.0	--
Naphthalene	ND		ug/kg	4.0	--
n-Propylbenzene	ND		ug/kg	1.0	--
1,2,3-Trichlorobenzene	ND		ug/kg	2.0	--
1,2,4-Trichlorobenzene	ND		ug/kg	2.0	--
1,3,5-Trimethylbenzene	ND		ug/kg	2.0	--
1,2,4-Trimethylbenzene	ND		ug/kg	2.0	--
Diethyl ether	ND		ug/kg	2.0	--
Diisopropyl Ether	ND		ug/kg	2.0	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	2.0	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	2.0	--
1,4-Dioxane	ND		ug/kg	80	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	99		70-130
Toluene-d8	95		70-130
4-Bromofluorobenzene	97		70-130
Dibromofluoromethane	110		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2406353
Report Date: 02/08/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1882758-3 WG1882758-4								
Methylene chloride	99		96		70-130	3		20
1,1-Dichloroethane	105		99		70-130	6		20
Chloroform	110		102		70-130	8		20
Carbon tetrachloride	129		118		70-130	9		20
1,2-Dichloropropane	100		94		70-130	6		20
Dibromochloromethane	114		108		70-130	5		20
1,1,2-Trichloroethane	99		92		70-130	7		20
Tetrachloroethene	116		110		70-130	5		20
Chlorobenzene	105		99		70-130	6		20
Trichlorofluoromethane	71		**61**	Q	70-130	15		20
1,2-Dichloroethane	101		96		70-130	5		20
1,1,1-Trichloroethane	120		112		70-130	7		20
Bromodichloromethane	110		104		70-130	6		20
trans-1,3-Dichloropropene	96		91		70-130	5		20
cis-1,3-Dichloropropene	111		105		70-130	6		20
1,1-Dichloropropene	110		102		70-130	8		20
Bromoform	98		93		70-130	5		20
1,1,2,2-Tetrachloroethane	94		90		70-130	4		20
Benzene	106		100		70-130	6		20
Toluene	102		95		70-130	7		20
Ethylbenzene	101		94		70-130	7		20
Chloromethane	107		96		70-130	11		20
Bromomethane	**67**	Q	**60**	Q	70-130	11		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2406353
Report Date: 02/08/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1882758-3 WG1882758-4								
Vinyl chloride	84		75		70-130	11		20
Chloroethane	**67**	Q	**58**	Q	70-130	14		20
1,1-Dichloroethene	72		**63**	Q	70-130	13		20
trans-1,2-Dichloroethene	112		107		70-130	5		20
Trichloroethene	106		102		70-130	4		20
1,2-Dichlorobenzene	106		102		70-130	4		20
1,3-Dichlorobenzene	107		102		70-130	5		20
1,4-Dichlorobenzene	105		101		70-130	4		20
Methyl tert butyl ether	97		95		70-130	2		20
p/m-Xylene	106		99		70-130	7		20
o-Xylene	94		88		70-130	7		20
cis-1,2-Dichloroethene	106		101		70-130	5		20
Dibromomethane	104		99		70-130	5		20
1,2,3-Trichloropropane	91		85		70-130	7		20
Styrene	101		96		70-130	5		20
Dichlorodifluoromethane	91		81		70-130	12		20
Acetone	89		91		70-130	2		20
Carbon disulfide	71		**62**	Q	70-130	14		20
Methyl ethyl ketone	83		78		70-130	6		20
Methyl isobutyl ketone	75		72		70-130	4		20
2-Hexanone	76		70		70-130	8		20
Bromochloromethane	116		111		70-130	4		20
Tetrahydrofuran	88		78		70-130	12		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2406353
Report Date: 02/08/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1882758-3 WG1882758-4								
2,2-Dichloropropane	115		107		70-130	7		20
1,2-Dibromoethane	104		99		70-130	5		20
1,3-Dichloropropane	99		93		70-130	6		20
1,1,1,2-Tetrachloroethane	117		110		70-130	6		20
Bromobenzene	106		101		70-130	5		20
n-Butylbenzene	102		96		70-130	6		20
sec-Butylbenzene	101		96		70-130	5		20
tert-Butylbenzene	104		99		70-130	5		20
o-Chlorotoluene	102		98		70-130	4		20
p-Chlorotoluene	102		97		70-130	5		20
1,2-Dibromo-3-chloropropane	104		99		70-130	5		20
Hexachlorobutadiene	112		106		70-130	6		20
Isopropylbenzene	102		97		70-130	5		20
p-Isopropyltoluene	105		100		70-130	5		20
Naphthalene	96		91		70-130	5		20
n-Propylbenzene	100		95		70-130	5		20
1,2,3-Trichlorobenzene	110		105		70-130	5		20
1,2,4-Trichlorobenzene	112		106		70-130	6		20
1,3,5-Trimethylbenzene	102		97		70-130	5		20
1,2,4-Trimethylbenzene	102		97		70-130	5		20
Diethyl ether	**69**	Q	**62**	Q	70-130	11		20
Diisopropyl Ether	101		96		70-130	5		20
Ethyl-Tert-Butyl-Ether	96		91		70-130	5		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2406353

Report Date: 02/08/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1882758-3 WG1882758-4								
Tertiary-Amyl Methyl Ether	90		87		70-130	3		20
1,4-Dioxane	96		91		70-130	5		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	94		94		70-130
Toluene-d8	95		94		70-130
4-Bromofluorobenzene	101		102		70-130
Dibromofluoromethane	108		106		70-130

SEMIVOLATILES

Project Name: LEDGE RD LANDFILL
Lab Number: L2406353
Project Number: 289302
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-01
Client ID: WRA-2
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 09:55
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8270E
Analytical Date: 02/08/24 09:53
Analyst: IM
Percent Solids: 86%

Extraction Method: EPA 3546
Extraction Date: 02/07/24 03:40

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP PAHs - Westborough Lab						
Acenaphthene	ND		ug/kg	150	--	1
Fluoranthene	160		ug/kg	110	--	1
Naphthalene	ND		ug/kg	190	--	1
Benzo(a)anthracene	ND		ug/kg	110	--	1
Benzo(a)pyrene	ND		ug/kg	150	--	1
Benzo(b)fluoranthene	ND		ug/kg	110	--	1
Benzo(k)fluoranthene	ND		ug/kg	110	--	1
Chrysene	110		ug/kg	110	--	1
Acenaphthylene	ND		ug/kg	150	--	1
Anthracene	ND		ug/kg	110	--	1
Benzo(ghi)perylene	ND		ug/kg	150	--	1
Fluorene	ND		ug/kg	190	--	1
Phenanthrene	190		ug/kg	110	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	80	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	150	--	1
Pyrene	220		ug/kg	110	--	1
2-Methylnaphthalene	ND		ug/kg	80	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	66		30-130
2-Fluorobiphenyl	68		30-130
4-Terphenyl-d14	75		30-130

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2406353
Report Date: 02/08/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E
Analytical Date: 02/08/24 08:45
Analyst: IM

Extraction Method: EPA 3546
Extraction Date: 02/07/24 03:39

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01 Batch: WG1882343-1					
Acenaphthene	ND		ug/kg	130	--
Fluoranthene	ND		ug/kg	98	--
Naphthalene	ND		ug/kg	160	--
Benzo(a)anthracene	ND		ug/kg	98	--
Benzo(a)pyrene	ND		ug/kg	130	--
Benzo(b)fluoranthene	ND		ug/kg	98	--
Benzo(k)fluoranthene	ND		ug/kg	98	--
Chrysene	ND		ug/kg	98	--
Acenaphthylene	ND		ug/kg	130	--
Anthracene	ND		ug/kg	98	--
Benzo(ghi)perylene	ND		ug/kg	130	--
Fluorene	ND		ug/kg	160	--
Phenanthrene	ND		ug/kg	98	--
Dibenzo(a,h)anthracene	ND		ug/kg	68	--
Indeno(1,2,3-cd)pyrene	ND		ug/kg	130	--
Pyrene	ND		ug/kg	98	--
2-Methylnaphthalene	ND		ug/kg	68	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	71		30-130
2-Fluorobiphenyl	77		30-130
4-Terphenyl-d14	91		30-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2406353
Report Date: 02/08/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01 Batch: WG1882343-2 WG1882343-3								
Acenaphthene	94		85		40-140	10		30
Fluoranthene	107		97		40-140	10		30
Naphthalene	95		87		40-140	9		30
Benzo(a)anthracene	94		86		40-140	9		30
Benzo(a)pyrene	104		98		40-140	6		30
Benzo(b)fluoranthene	97		90		40-140	7		30
Benzo(k)fluoranthene	96		88		40-140	9		30
Chrysene	94		86		40-140	9		30
Acenaphthylene	104		93		40-140	11		30
Anthracene	106		96		40-140	10		30
Benzo(ghi)perylene	90		82		40-140	9		30
Fluorene	104		95		40-140	9		30
Phenanthrene	103		92		40-140	11		30
Dibenzo(a,h)anthracene	94		86		40-140	9		30
Indeno(1,2,3-cd)pyrene	100		92		40-140	8		30
Pyrene	105		95		40-140	10		30
2-Methylnaphthalene	100		89		40-140	12		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01 Batch: WG1882343-2 WG1882343-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Nitrobenzene-d5	85		79		30-130
2-Fluorobiphenyl	90		84		30-130
4-Terphenyl-d14	102		94		30-130

PETROLEUM HYDROCARBONS

Project Name: LEDGE RD LANDFILL
Lab Number: L2406353
Project Number: 289302
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-01
Client ID: WRA-2
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 09:55
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 1,8015D(M)
Analytical Date: 02/08/24 09:53
Analyst: LMR
Percent Solids: 86%

Extraction Method: EPA 3546
Extraction Date: 02/07/24 21:10

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C10-C36)	ND		ug/kg	37300	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	61		40-140

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2406353
Report Date: 02/08/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015D(M)
Analytical Date: 02/07/24 07:57
Analyst: CRE

Extraction Method: EPA 3546
Extraction Date: 02/06/24 21:27

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbon Quantitation - Westborough Lab for sample(s): 01 Batch: WG1882298-1					
TPH (C10-C36)	ND		ug/kg	31800	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	69		40-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2406353

Report Date: 02/08/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 01 Batch: WG1882298-2								
TPH (C10-C36)	63		-		40-140	-		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
o-Terphenyl	67				40-140

PCBS

Project Name: LEDGE RD LANDFILL
Lab Number: L2406353
Project Number: 289302
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-01
Client ID: WRA-2
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 09:55
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8082A
Analytical Date: 02/07/24 12:46
Analyst: MHG
Percent Solids: 86%

Extraction Method: EPA 3546
Extraction Date: 02/07/24 06:16
Cleanup Method: EPA 3665A
Cleanup Date: 02/07/24
Cleanup Method: EPA 3660B
Cleanup Date: 02/07/24

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	55.9	--	1	A
Aroclor 1221	ND		ug/kg	55.9	--	1	A
Aroclor 1232	ND		ug/kg	55.9	--	1	A
Aroclor 1242	ND		ug/kg	55.9	--	1	A
Aroclor 1248	ND		ug/kg	55.9	--	1	A
Aroclor 1254	ND		ug/kg	55.9	--	1	A
Aroclor 1260	ND		ug/kg	55.9	--	1	B
Aroclor 1262	ND		ug/kg	55.9	--	1	A
Aroclor 1268	ND		ug/kg	55.9	--	1	A
PCBs, Total	ND		ug/kg	55.9	--	1	B

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	56		30-150	A
Decachlorobiphenyl	57		30-150	A
2,4,5,6-Tetrachloro-m-xylene	61		30-150	B
Decachlorobiphenyl	56		30-150	B

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2406353
Report Date: 02/08/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082A
Analytical Date: 02/07/24 08:00
Analyst: MHG

Extraction Method: EPA 3546
Extraction Date: 02/06/24 07:33
Cleanup Method: EPA 3665A
Cleanup Date: 02/07/24
Cleanup Method: EPA 3660B
Cleanup Date: 02/07/24

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01 Batch: WG1882021-1						
Aroclor 1016	ND		ug/kg	49.4	--	A
Aroclor 1221	ND		ug/kg	49.4	--	A
Aroclor 1232	ND		ug/kg	49.4	--	A
Aroclor 1242	ND		ug/kg	49.4	--	A
Aroclor 1248	ND		ug/kg	49.4	--	A
Aroclor 1254	ND		ug/kg	49.4	--	A
Aroclor 1260	ND		ug/kg	49.4	--	A
Aroclor 1262	ND		ug/kg	49.4	--	A
Aroclor 1268	ND		ug/kg	49.4	--	A
PCBs, Total	ND		ug/kg	49.4	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	72		30-150	A
Decachlorobiphenyl	83		30-150	A
2,4,5,6-Tetrachloro-m-xylene	80		30-150	B
Decachlorobiphenyl	83		30-150	B

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2406353
Report Date: 02/08/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01 Batch: WG1882021-2 WG1882021-3									
Aroclor 1016	72		73		40-140	1		30	A
Aroclor 1260	75		77		40-140	3		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	69		69		30-150	A
Decachlorobiphenyl	78		78		30-150	A
2,4,5,6-Tetrachloro-m-xylene	74		74		30-150	B
Decachlorobiphenyl	77		79		30-150	B

METALS

Project Name: LEDGE RD LANDFILL
Lab Number: L2406353
Project Number: 289302
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-01
Client ID: WRA-2
Sample Location: ANDOVER, MA
Date Collected: 02/05/24 09:55
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 86%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	3.51		mg/kg	2.23	--	1	02/06/24 23:28	02/07/24 08:48	EPA 3050B	97,6010D	DHL
Arsenic, Total	6.72		mg/kg	0.446	--	1	02/06/24 23:28	02/07/24 08:48	EPA 3050B	97,6010D	DHL
Barium, Total	80.7		mg/kg	0.446	--	1	02/06/24 23:28	02/07/24 08:48	EPA 3050B	97,6010D	DHL
Beryllium, Total	0.468		mg/kg	0.223	--	1	02/06/24 23:28	02/07/24 08:48	EPA 3050B	97,6010D	DHL
Cadmium, Total	0.453		mg/kg	0.446	--	1	02/06/24 23:28	02/07/24 08:48	EPA 3050B	97,6010D	DHL
Chromium, Total	13.4		mg/kg	0.446	--	1	02/06/24 23:28	02/07/24 08:48	EPA 3050B	97,6010D	DHL
Lead, Total	34.0		mg/kg	2.23	--	1	02/06/24 23:28	02/07/24 08:48	EPA 3050B	97,6010D	DHL
Mercury, Total	0.088		mg/kg	0.086	--	1	02/07/24 00:00	02/07/24 11:07	EPA 7471B	97,7471B	GMG
Nickel, Total	11.3		mg/kg	1.12	--	1	02/06/24 23:28	02/07/24 08:48	EPA 3050B	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.23	--	1	02/06/24 23:28	02/07/24 08:48	EPA 3050B	97,6010D	DHL
Silver, Total	ND		mg/kg	0.446	--	1	02/06/24 23:28	02/07/24 08:48	EPA 3050B	97,6010D	DHL
Thallium, Total	ND		mg/kg	2.23	--	1	02/06/24 23:28	02/07/24 08:48	EPA 3050B	97,6010D	DHL
Vanadium, Total	9.69		mg/kg	0.446	--	1	02/06/24 23:28	02/07/24 08:48	EPA 3050B	97,6010D	DHL
Zinc, Total	228		mg/kg	2.23	--	1	02/06/24 23:28	02/07/24 08:48	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL **Lab Number:** L2406353

Project Number: 289302 **Report Date:** 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-02 Date Collected: 02/05/24 11:35

Client ID: WRA-1-S-2 Date Received: 02/06/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 80%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.44	--	1	02/06/24 23:28	02/07/24 08:52	EPA 3050B	97,6010D	DHL
Arsenic, Total	1.89		mg/kg	0.488	--	1	02/06/24 23:28	02/07/24 08:52	EPA 3050B	97,6010D	DHL
Barium, Total	21.0		mg/kg	0.488	--	1	02/06/24 23:28	02/07/24 08:52	EPA 3050B	97,6010D	DHL
Beryllium, Total	ND		mg/kg	0.244	--	1	02/06/24 23:28	02/07/24 08:52	EPA 3050B	97,6010D	DHL
Cadmium, Total	ND		mg/kg	0.488	--	1	02/06/24 23:28	02/07/24 08:52	EPA 3050B	97,6010D	DHL
Chromium, Total	12.9		mg/kg	0.488	--	1	02/06/24 23:28	02/07/24 08:52	EPA 3050B	97,6010D	DHL
Lead, Total	2.74		mg/kg	2.44	--	1	02/06/24 23:28	02/07/24 08:52	EPA 3050B	97,6010D	DHL
Mercury, Total	ND		mg/kg	0.091	--	1	02/07/24 00:00	02/07/24 11:10	EPA 7471B	97,7471B	GMG
Nickel, Total	11.7		mg/kg	1.22	--	1	02/06/24 23:28	02/07/24 08:52	EPA 3050B	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.44	--	1	02/06/24 23:28	02/07/24 08:52	EPA 3050B	97,6010D	DHL
Silver, Total	ND		mg/kg	0.488	--	1	02/06/24 23:28	02/07/24 08:52	EPA 3050B	97,6010D	DHL
Thallium, Total	ND		mg/kg	2.44	--	1	02/06/24 23:28	02/07/24 08:52	EPA 3050B	97,6010D	DHL
Vanadium, Total	6.96		mg/kg	0.488	--	1	02/06/24 23:28	02/07/24 08:52	EPA 3050B	97,6010D	DHL
Zinc, Total	19.7		mg/kg	2.44	--	1	02/06/24 23:28	02/07/24 08:52	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2406353
Project Number: 289302
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-03
Client ID: WRA-1-S-1
Sample Location: ANDOVER, MA
Date Collected: 02/05/24 11:45
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 84%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.38	--	1	02/06/24 23:28	02/07/24 08:55	EPA 3050B	97,6010D	DHL
Arsenic, Total	0.893		mg/kg	0.476	--	1	02/06/24 23:28	02/07/24 08:55	EPA 3050B	97,6010D	DHL
Barium, Total	12.3		mg/kg	0.476	--	1	02/06/24 23:28	02/07/24 08:55	EPA 3050B	97,6010D	DHL
Beryllium, Total	ND		mg/kg	0.238	--	1	02/06/24 23:28	02/07/24 08:55	EPA 3050B	97,6010D	DHL
Cadmium, Total	ND		mg/kg	0.476	--	1	02/06/24 23:28	02/07/24 08:55	EPA 3050B	97,6010D	DHL
Chromium, Total	8.15		mg/kg	0.476	--	1	02/06/24 23:28	02/07/24 08:55	EPA 3050B	97,6010D	DHL
Lead, Total	ND		mg/kg	2.38	--	1	02/06/24 23:28	02/07/24 08:55	EPA 3050B	97,6010D	DHL
Mercury, Total	ND		mg/kg	0.088	--	1	02/07/24 00:00	02/07/24 11:20	EPA 7471B	97,7471B	GMG
Nickel, Total	7.69		mg/kg	1.19	--	1	02/06/24 23:28	02/07/24 08:55	EPA 3050B	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.38	--	1	02/06/24 23:28	02/07/24 08:55	EPA 3050B	97,6010D	DHL
Silver, Total	ND		mg/kg	0.476	--	1	02/06/24 23:28	02/07/24 08:55	EPA 3050B	97,6010D	DHL
Thallium, Total	ND		mg/kg	2.38	--	1	02/06/24 23:28	02/07/24 08:55	EPA 3050B	97,6010D	DHL
Vanadium, Total	4.54		mg/kg	0.476	--	1	02/06/24 23:28	02/07/24 08:55	EPA 3050B	97,6010D	DHL
Zinc, Total	11.4		mg/kg	2.38	--	1	02/06/24 23:28	02/07/24 08:55	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2406353
Project Number: 289302
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-04
Client ID: WRA-1-N-5
Sample Location: ANDOVER, MA
Date Collected: 02/05/24 11:55
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 83%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.32	--	1	02/06/24 23:28	02/07/24 08:58	EPA 3050B	97,6010D	DHL
Arsenic, Total	0.662		mg/kg	0.464	--	1	02/06/24 23:28	02/07/24 08:58	EPA 3050B	97,6010D	DHL
Barium, Total	8.84		mg/kg	0.464	--	1	02/06/24 23:28	02/07/24 08:58	EPA 3050B	97,6010D	DHL
Beryllium, Total	ND		mg/kg	0.232	--	1	02/06/24 23:28	02/07/24 08:58	EPA 3050B	97,6010D	DHL
Cadmium, Total	ND		mg/kg	0.464	--	1	02/06/24 23:28	02/07/24 08:58	EPA 3050B	97,6010D	DHL
Chromium, Total	6.74		mg/kg	0.464	--	1	02/06/24 23:28	02/07/24 08:58	EPA 3050B	97,6010D	DHL
Lead, Total	ND		mg/kg	2.32	--	1	02/06/24 23:28	02/07/24 08:58	EPA 3050B	97,6010D	DHL
Mercury, Total	ND		mg/kg	0.087	--	1	02/07/24 00:00	02/07/24 11:24	EPA 7471B	97,7471B	GMG
Nickel, Total	5.64		mg/kg	1.16	--	1	02/06/24 23:28	02/07/24 08:58	EPA 3050B	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.32	--	1	02/06/24 23:28	02/07/24 08:58	EPA 3050B	97,6010D	DHL
Silver, Total	ND		mg/kg	0.464	--	1	02/06/24 23:28	02/07/24 08:58	EPA 3050B	97,6010D	DHL
Thallium, Total	ND		mg/kg	2.32	--	1	02/06/24 23:28	02/07/24 08:58	EPA 3050B	97,6010D	DHL
Vanadium, Total	3.34		mg/kg	0.464	--	1	02/06/24 23:28	02/07/24 08:58	EPA 3050B	97,6010D	DHL
Zinc, Total	4.79		mg/kg	2.32	--	1	02/06/24 23:28	02/07/24 08:58	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2406353
Project Number: 289302
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-05
Client ID: WRA-1-N-4
Sample Location: ANDOVER, MA
Date Collected: 02/05/24 13:10
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 87%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.27	--	1	02/06/24 23:28	02/07/24 09:01	EPA 3050B	97,6010D	DHL
Arsenic, Total	86.8		mg/kg	0.454	--	1	02/06/24 23:28	02/07/24 09:01	EPA 3050B	97,6010D	DHL
Barium, Total	39.0		mg/kg	0.454	--	1	02/06/24 23:28	02/07/24 09:01	EPA 3050B	97,6010D	DHL
Beryllium, Total	0.323		mg/kg	0.227	--	1	02/06/24 23:28	02/07/24 09:01	EPA 3050B	97,6010D	DHL
Cadmium, Total	ND		mg/kg	0.454	--	1	02/06/24 23:28	02/07/24 09:01	EPA 3050B	97,6010D	DHL
Chromium, Total	23.3		mg/kg	0.454	--	1	02/06/24 23:28	02/07/24 09:01	EPA 3050B	97,6010D	DHL
Lead, Total	12.0		mg/kg	2.27	--	1	02/06/24 23:28	02/07/24 09:01	EPA 3050B	97,6010D	DHL
Mercury, Total	ND		mg/kg	0.083	--	1	02/07/24 00:00	02/07/24 11:27	EPA 7471B	97,7471B	GMG
Nickel, Total	16.2		mg/kg	1.14	--	1	02/06/24 23:28	02/07/24 09:01	EPA 3050B	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.27	--	1	02/06/24 23:28	02/07/24 09:01	EPA 3050B	97,6010D	DHL
Silver, Total	ND		mg/kg	0.454	--	1	02/06/24 23:28	02/07/24 09:01	EPA 3050B	97,6010D	DHL
Thallium, Total	ND		mg/kg	2.27	--	1	02/06/24 23:28	02/07/24 09:01	EPA 3050B	97,6010D	DHL
Vanadium, Total	11.3		mg/kg	0.454	--	1	02/06/24 23:28	02/07/24 09:01	EPA 3050B	97,6010D	DHL
Zinc, Total	64.0		mg/kg	2.27	--	1	02/06/24 23:28	02/07/24 09:01	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL **Lab Number:** L2406353

Project Number: 289302 **Report Date:** 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-06 Date Collected: 02/05/24 13:45

Client ID: WRA-1-N-3 Date Received: 02/06/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 90%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.19	--	1	02/06/24 23:28	02/07/24 09:04	EPA 3050B	97,6010D	DHL
Arsenic, Total	6.30		mg/kg	0.437	--	1	02/06/24 23:28	02/07/24 09:04	EPA 3050B	97,6010D	DHL
Barium, Total	19.5		mg/kg	0.437	--	1	02/06/24 23:28	02/07/24 09:04	EPA 3050B	97,6010D	DHL
Beryllium, Total	0.226		mg/kg	0.219	--	1	02/06/24 23:28	02/07/24 09:04	EPA 3050B	97,6010D	DHL
Cadmium, Total	ND		mg/kg	0.437	--	1	02/06/24 23:28	02/07/24 09:04	EPA 3050B	97,6010D	DHL
Chromium, Total	10.4		mg/kg	0.437	--	1	02/06/24 23:28	02/07/24 09:04	EPA 3050B	97,6010D	DHL
Lead, Total	3.47		mg/kg	2.19	--	1	02/06/24 23:28	02/07/24 09:04	EPA 3050B	97,6010D	DHL
Mercury, Total	ND		mg/kg	0.083	--	1	02/07/24 00:00	02/07/24 11:30	EPA 7471B	97,7471B	GMG
Nickel, Total	11.1		mg/kg	1.09	--	1	02/06/24 23:28	02/07/24 09:04	EPA 3050B	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.19	--	1	02/06/24 23:28	02/07/24 09:04	EPA 3050B	97,6010D	DHL
Silver, Total	ND		mg/kg	0.437	--	1	02/06/24 23:28	02/07/24 09:04	EPA 3050B	97,6010D	DHL
Thallium, Total	ND		mg/kg	2.19	--	1	02/06/24 23:28	02/07/24 09:04	EPA 3050B	97,6010D	DHL
Vanadium, Total	7.31		mg/kg	0.437	--	1	02/06/24 23:28	02/07/24 09:04	EPA 3050B	97,6010D	DHL
Zinc, Total	33.7		mg/kg	2.19	--	1	02/06/24 23:28	02/07/24 09:04	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2406353
Project Number: 289302
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-07
Client ID: WRA-1-N-2
Sample Location: ANDOVER, MA
Date Collected: 02/05/24 14:10
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 84%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.30	--	1	02/06/24 23:28	02/07/24 09:08	EPA 3050B	97,6010D	DHL
Arsenic, Total	5.34		mg/kg	0.460	--	1	02/06/24 23:28	02/07/24 09:08	EPA 3050B	97,6010D	DHL
Barium, Total	12.2		mg/kg	0.460	--	1	02/06/24 23:28	02/07/24 09:08	EPA 3050B	97,6010D	DHL
Beryllium, Total	0.239		mg/kg	0.230	--	1	02/06/24 23:28	02/07/24 09:08	EPA 3050B	97,6010D	DHL
Cadmium, Total	ND		mg/kg	0.460	--	1	02/06/24 23:28	02/07/24 09:08	EPA 3050B	97,6010D	DHL
Chromium, Total	11.5		mg/kg	0.460	--	1	02/06/24 23:28	02/07/24 09:08	EPA 3050B	97,6010D	DHL
Lead, Total	2.70		mg/kg	2.30	--	1	02/06/24 23:28	02/07/24 09:08	EPA 3050B	97,6010D	DHL
Mercury, Total	ND		mg/kg	0.087	--	1	02/07/24 00:00	02/07/24 11:34	EPA 7471B	97,7471B	GMG
Nickel, Total	12.0		mg/kg	1.15	--	1	02/06/24 23:28	02/07/24 09:08	EPA 3050B	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.30	--	1	02/06/24 23:28	02/07/24 09:08	EPA 3050B	97,6010D	DHL
Silver, Total	ND		mg/kg	0.460	--	1	02/06/24 23:28	02/07/24 09:08	EPA 3050B	97,6010D	DHL
Thallium, Total	ND		mg/kg	2.30	--	1	02/06/24 23:28	02/07/24 09:08	EPA 3050B	97,6010D	DHL
Vanadium, Total	8.59		mg/kg	0.460	--	1	02/06/24 23:28	02/07/24 09:08	EPA 3050B	97,6010D	DHL
Zinc, Total	11.9		mg/kg	2.30	--	1	02/06/24 23:28	02/07/24 09:08	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL **Lab Number:** L2406353

Project Number: 289302 **Report Date:** 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-08 Date Collected: 02/05/24 14:20

Client ID: WRA-1-N-1 Date Received: 02/06/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 83%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.32	--	1	02/06/24 23:28	02/07/24 09:33	EPA 3050B	97,6010D	DHL
Arsenic, Total	13.5		mg/kg	0.465	--	1	02/06/24 23:28	02/07/24 09:33	EPA 3050B	97,6010D	DHL
Barium, Total	39.0		mg/kg	0.465	--	1	02/06/24 23:28	02/07/24 09:33	EPA 3050B	97,6010D	DHL
Beryllium, Total	0.516		mg/kg	0.232	--	1	02/06/24 23:28	02/07/24 09:33	EPA 3050B	97,6010D	DHL
Cadmium, Total	ND		mg/kg	0.465	--	1	02/06/24 23:28	02/07/24 09:33	EPA 3050B	97,6010D	DHL
Chromium, Total	24.7		mg/kg	0.465	--	1	02/06/24 23:28	02/07/24 09:33	EPA 3050B	97,6010D	DHL
Lead, Total	4.19		mg/kg	2.32	--	1	02/06/24 23:28	02/07/24 09:33	EPA 3050B	97,6010D	DHL
Mercury, Total	ND		mg/kg	0.091	--	1	02/07/24 00:00	02/07/24 11:37	EPA 7471B	97,7471B	GMG
Nickel, Total	15.7		mg/kg	1.16	--	1	02/06/24 23:28	02/07/24 09:33	EPA 3050B	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.32	--	1	02/06/24 23:28	02/07/24 09:33	EPA 3050B	97,6010D	DHL
Silver, Total	ND		mg/kg	0.465	--	1	02/06/24 23:28	02/07/24 09:33	EPA 3050B	97,6010D	DHL
Thallium, Total	ND		mg/kg	2.32	--	1	02/06/24 23:28	02/07/24 09:33	EPA 3050B	97,6010D	DHL
Vanadium, Total	21.5		mg/kg	0.465	--	1	02/06/24 23:28	02/07/24 09:33	EPA 3050B	97,6010D	DHL
Zinc, Total	28.2		mg/kg	2.32	--	1	02/06/24 23:28	02/07/24 09:33	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2406353
Project Number: 289302
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-09
Client ID: WRA-1-S-5
Sample Location: ANDOVER, MA
Date Collected: 02/05/24 14:45
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 84%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.30	--	1	02/06/24 23:28	02/07/24 10:11	EPA 3050B	97,6010D	DHL
Arsenic, Total	6.58		mg/kg	0.460	--	1	02/06/24 23:28	02/07/24 10:11	EPA 3050B	97,6010D	DHL
Barium, Total	46.4		mg/kg	0.460	--	1	02/06/24 23:28	02/07/24 10:11	EPA 3050B	97,6010D	DHL
Beryllium, Total	0.380		mg/kg	0.230	--	1	02/06/24 23:28	02/07/24 10:11	EPA 3050B	97,6010D	DHL
Cadmium, Total	15.7		mg/kg	0.460	--	1	02/06/24 23:28	02/07/24 10:11	EPA 3050B	97,6010D	DHL
Chromium, Total	16.6		mg/kg	0.460	--	1	02/06/24 23:28	02/07/24 10:11	EPA 3050B	97,6010D	DHL
Lead, Total	24.5		mg/kg	2.30	--	1	02/06/24 23:28	02/07/24 10:11	EPA 3050B	97,6010D	DHL
Mercury, Total	ND		mg/kg	0.089	--	1	02/07/24 00:00	02/07/24 11:40	EPA 7471B	97,7471B	GMG
Nickel, Total	13.7		mg/kg	1.15	--	1	02/06/24 23:28	02/07/24 10:11	EPA 3050B	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.30	--	1	02/06/24 23:28	02/07/24 10:11	EPA 3050B	97,6010D	DHL
Silver, Total	ND		mg/kg	0.460	--	1	02/06/24 23:28	02/07/24 10:11	EPA 3050B	97,6010D	DHL
Thallium, Total	ND		mg/kg	2.30	--	1	02/06/24 23:28	02/07/24 10:11	EPA 3050B	97,6010D	DHL
Vanadium, Total	9.96		mg/kg	0.460	--	1	02/06/24 23:28	02/07/24 10:11	EPA 3050B	97,6010D	DHL
Zinc, Total	114		mg/kg	2.30	--	1	02/06/24 23:28	02/07/24 10:11	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2406353
Project Number: 289302
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-10
Client ID: WRA-1-S-3
Sample Location: ANDOVER, MA
Date Collected: 02/05/24 15:40
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 82%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.42	--	1	02/06/24 23:28	02/07/24 10:14	EPA 3050B	97,6010D	DHL
Arsenic, Total	1.75		mg/kg	0.483	--	1	02/06/24 23:28	02/07/24 10:14	EPA 3050B	97,6010D	DHL
Barium, Total	8.33		mg/kg	0.483	--	1	02/06/24 23:28	02/07/24 10:14	EPA 3050B	97,6010D	DHL
Beryllium, Total	ND		mg/kg	0.242	--	1	02/06/24 23:28	02/07/24 10:14	EPA 3050B	97,6010D	DHL
Cadmium, Total	ND		mg/kg	0.483	--	1	02/06/24 23:28	02/07/24 10:14	EPA 3050B	97,6010D	DHL
Chromium, Total	4.81		mg/kg	0.483	--	1	02/06/24 23:28	02/07/24 10:14	EPA 3050B	97,6010D	DHL
Lead, Total	2.91		mg/kg	2.42	--	1	02/06/24 23:28	02/07/24 10:14	EPA 3050B	97,6010D	DHL
Mercury, Total	ND		mg/kg	0.090	--	1	02/07/24 00:00	02/07/24 11:43	EPA 7471B	97,7471B	GMG
Nickel, Total	8.07		mg/kg	1.21	--	1	02/06/24 23:28	02/07/24 10:14	EPA 3050B	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.42	--	1	02/06/24 23:28	02/07/24 10:14	EPA 3050B	97,6010D	DHL
Silver, Total	ND		mg/kg	0.483	--	1	02/06/24 23:28	02/07/24 10:14	EPA 3050B	97,6010D	DHL
Thallium, Total	ND		mg/kg	2.42	--	1	02/06/24 23:28	02/07/24 10:14	EPA 3050B	97,6010D	DHL
Vanadium, Total	3.06		mg/kg	0.483	--	1	02/06/24 23:28	02/07/24 10:14	EPA 3050B	97,6010D	DHL
Zinc, Total	14.1		mg/kg	2.42	--	1	02/06/24 23:28	02/07/24 10:14	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2406353
Project Number: 289302
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-11
Client ID: WRA-1-S-4
Sample Location: ANDOVER, MA
Date Collected: 02/05/24 15:50
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 85%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.34	--	1	02/06/24 23:28	02/07/24 10:17	EPA 3050B	97,6010D	DHL
Arsenic, Total	2.63		mg/kg	0.468	--	1	02/06/24 23:28	02/07/24 10:17	EPA 3050B	97,6010D	DHL
Barium, Total	23.4		mg/kg	0.468	--	1	02/06/24 23:28	02/07/24 10:17	EPA 3050B	97,6010D	DHL
Beryllium, Total	ND		mg/kg	0.234	--	1	02/06/24 23:28	02/07/24 10:17	EPA 3050B	97,6010D	DHL
Cadmium, Total	ND		mg/kg	0.468	--	1	02/06/24 23:28	02/07/24 10:17	EPA 3050B	97,6010D	DHL
Chromium, Total	15.5		mg/kg	0.468	--	1	02/06/24 23:28	02/07/24 10:17	EPA 3050B	97,6010D	DHL
Lead, Total	3.40		mg/kg	2.34	--	1	02/06/24 23:28	02/07/24 10:17	EPA 3050B	97,6010D	DHL
Mercury, Total	ND		mg/kg	0.084	--	1	02/07/24 00:00	02/07/24 11:47	EPA 7471B	97,7471B	GMG
Nickel, Total	11.5		mg/kg	1.17	--	1	02/06/24 23:28	02/07/24 10:17	EPA 3050B	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.34	--	1	02/06/24 23:28	02/07/24 10:17	EPA 3050B	97,6010D	DHL
Silver, Total	ND		mg/kg	0.468	--	1	02/06/24 23:28	02/07/24 10:17	EPA 3050B	97,6010D	DHL
Thallium, Total	ND		mg/kg	2.34	--	1	02/06/24 23:28	02/07/24 10:17	EPA 3050B	97,6010D	DHL
Vanadium, Total	10.6		mg/kg	0.468	--	1	02/06/24 23:28	02/07/24 10:17	EPA 3050B	97,6010D	DHL
Zinc, Total	25.4		mg/kg	2.34	--	1	02/06/24 23:28	02/07/24 10:17	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL **Lab Number:** L2406353

Project Number: 289302 **Report Date:** 02/08/24

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-11 Batch: WG1882301-1										
Antimony, Total	ND		mg/kg	2.00	--	1	02/06/24 23:28	02/07/24 08:38	97,6010D	DHL
Arsenic, Total	ND		mg/kg	0.400	--	1	02/06/24 23:28	02/07/24 08:38	97,6010D	DHL
Barium, Total	ND		mg/kg	0.400	--	1	02/06/24 23:28	02/07/24 08:38	97,6010D	DHL
Beryllium, Total	ND		mg/kg	0.200	--	1	02/06/24 23:28	02/07/24 08:38	97,6010D	DHL
Cadmium, Total	ND		mg/kg	0.400	--	1	02/06/24 23:28	02/07/24 08:38	97,6010D	DHL
Chromium, Total	ND		mg/kg	0.400	--	1	02/06/24 23:28	02/07/24 08:38	97,6010D	DHL
Lead, Total	ND		mg/kg	2.00	--	1	02/06/24 23:28	02/07/24 08:38	97,6010D	DHL
Nickel, Total	ND		mg/kg	1.00	--	1	02/06/24 23:28	02/07/24 08:38	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.00	--	1	02/06/24 23:28	02/07/24 08:38	97,6010D	DHL
Silver, Total	ND		mg/kg	0.400	--	1	02/06/24 23:28	02/07/24 08:38	97,6010D	DHL
Thallium, Total	ND		mg/kg	2.00	--	1	02/06/24 23:28	02/07/24 08:38	97,6010D	DHL
Vanadium, Total	ND		mg/kg	0.400	--	1	02/06/24 23:28	02/07/24 08:38	97,6010D	DHL
Zinc, Total	ND		mg/kg	2.00	--	1	02/06/24 23:28	02/07/24 08:38	97,6010D	DHL

Prep Information

Digestion Method: EPA 3050B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-11 Batch: WG1882302-1										
Mercury, Total	ND		mg/kg	0.083	--	1	02/07/24 00:00	02/07/24 10:57	97,7471B	GMG

Prep Information

Digestion Method: EPA 7471B

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2406353

Report Date: 02/08/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-11 Batch: WG1882301-2 WG1882301-3 SRM Lot Number: D122-540								
Antimony, Total	159		159		6-194	0		30
Arsenic, Total	110		105		81-119	5		30
Barium, Total	101		100		83-117	1		30
Beryllium, Total	99		105		83-117	6		30
Cadmium, Total	100		99		83-117	1		30
Chromium, Total	98		98		82-118	0		30
Lead, Total	108		102		83-117	6		30
Nickel, Total	103		101		83-117	2		30
Selenium, Total	116		112		81-119	4		30
Silver, Total	108		103		80-120	5		30
Thallium, Total	110		107		81-119	3		30
Vanadium, Total	97		94		80-120	3		30
Zinc, Total	99		96		82-119	3		30
MCP Total Metals - Mansfield Lab Associated sample(s): 01-11 Batch: WG1882302-2 WG1882302-3 SRM Lot Number: D122-540								
Mercury, Total	96		93		73-127	3		30

INORGANICS
&
MISCELLANEOUS

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-01
Client ID: WRA-2
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 09:55
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	86.3		%	0.100	NA	1	-	02/06/24 21:52	121,2540G	SJB

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-02
Client ID: WRA-1-S-2
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 11:35
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	79.8		%	0.100	NA	1	-	02/06/24 21:52	121,2540G	SJB

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-03
Client ID: WRA-1-S-1
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 11:45
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	83.5		%	0.100	NA	1	-	02/06/24 21:52	121,2540G	SJB

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-04
Client ID: WRA-1-N-5
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 11:55
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	82.6		%	0.100	NA	1	-	02/06/24 21:52	121,2540G	SJB

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-05
Client ID: WRA-1-N-4
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 13:10
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	87.1		%	0.100	NA	1	-	02/06/24 21:52	121,2540G	SJB

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-06
Client ID: WRA-1-N-3
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 13:45
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	90.3		%	0.100	NA	1	-	02/06/24 21:52	121,2540G	SJB

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-07
Client ID: WRA-1-N-2
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 14:10
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	83.6		%	0.100	NA	1	-	02/06/24 21:52	121,2540G	SJB

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-08
Client ID: WRA-1-N-1
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 14:20
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	82.6		%	0.100	NA	1	-	02/06/24 21:52	121,2540G	SJB

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-09
Client ID: WRA-1-S-5
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 14:45
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	84.1		%	0.100	NA	1	-	02/06/24 21:52	121,2540G	SJB

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-10
Client ID: WRA-1-S-3
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 15:40
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	81.8		%	0.100	NA	1	-	02/06/24 21:52	121,2540G	SJB

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-11
Client ID: WRA-1-S-4
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 15:50
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	85.0		%	0.100	NA	1	-	02/06/24 21:52	121,2540G	SJB

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2406353-01A	Vial MeOH preserved	A	NA		4.3	Y	Absent		MCP-8260HLW-21(14)
L2406353-01B	Vial water preserved	A	NA		4.3	Y	Absent	06-FEB-24 15:33	MCP-8260HLW-21(14)
L2406353-01C	Vial water preserved	A	NA		4.3	Y	Absent	06-FEB-24 15:33	MCP-8260HLW-21(14)
L2406353-01D	Plastic 2oz unpreserved for TS	A	NA		4.3	Y	Absent		TS(7)
L2406353-01E	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-CD-6010T-10(180),MCP-7471T-10(28),MCP-TL-6010T-10(180),MCP-ZN-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-PB-6010T-10(180),MCP-NI-6010T-10(180)
L2406353-01F	Glass 250ml/8oz unpreserved	A	NA		4.3	Y	Absent		MCP-8082-10(365),MCP-PAH-21(14),TPH-DRO-D(14)
L2406353-02A	Plastic 2oz unpreserved for TS	A	NA		4.3	Y	Absent		TS(7)
L2406353-02B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-TL-6010T-10(180),MCP-CD-6010T-10(180),MCP-ZN-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-V-6010T-10(180),MCP-BA-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L2406353-03A	Plastic 2oz unpreserved for TS	A	NA		4.3	Y	Absent		TS(7)
L2406353-03B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-TL-6010T-10(180),MCP-SB-6010T-10(180),MCP-ZN-6010T-10(180),MCP-AG-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L2406353-04A	Plastic 2oz unpreserved for TS	A	NA		4.3	Y	Absent		TS(7)

*Values in parentheses indicate holding time in days

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2406353-04B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-TL-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-AG-6010T-10(180),MCP-ZN-6010T-10(180),MCP-SB-6010T-10(180),MCP-SE-6010T-10(180),MCP-BE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L2406353-05A	Plastic 2oz unpreserved for TS	A	NA		4.3	Y	Absent		TS(7)
L2406353-05B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-TL-6010T-10(180),MCP-SB-6010T-10(180),MCP-ZN-6010T-10(180),MCP-AG-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-V-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180),MCP-NI-6010T-10(180)
L2406353-06A	Plastic 2oz unpreserved for TS	A	NA		4.3	Y	Absent		TS(7)
L2406353-06B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-TL-6010T-10(180),MCP-CD-6010T-10(180),MCP-ZN-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-SE-6010T-10(180),MCP-BE-6010T-10(180),MCP-V-6010T-10(180),MCP-BA-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L2406353-07A	Plastic 2oz unpreserved for TS	A	NA		4.3	Y	Absent		TS(7)
L2406353-07B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-CD-6010T-10(180),MCP-7471T-10(28),MCP-TL-6010T-10(180),MCP-SB-6010T-10(180),MCP-ZN-6010T-10(180),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-PB-6010T-10(180),MCP-NI-6010T-10(180)
L2406353-08A	Plastic 2oz unpreserved for TS	A	NA		4.3	Y	Absent		TS(7)
L2406353-08B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-TL-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-ZN-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-PB-6010T-10(180),MCP-NI-6010T-10(180)
L2406353-09A	Plastic 2oz unpreserved for TS	A	NA		4.3	Y	Absent		TS(7)

*Values in parentheses indicate holding time in days

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2406353-09B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-TL-6010T-10(180),MCP-CD-6010T-10(180),MCP-ZN-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-PB-6010T-10(180),MCP-NI-6010T-10(180)
L2406353-10A	Plastic 2oz unpreserved for TS	A	NA		4.3	Y	Absent		TS(7)
L2406353-10B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-TL-6010T-10(180),MCP-CD-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-ZN-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-V-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180),MCP-NI-6010T-10(180)
L2406353-11A	Plastic 2oz unpreserved for TS	A	NA		4.3	Y	Absent		TS(7)
L2406353-11B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-TL-6010T-10(180),MCP-ZN-6010T-10(180),MCP-SB-6010T-10(180),MCP-AG-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-V-6010T-10(180),MCP-BA-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)

*Values in parentheses indicate holding time in days

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2406353
Project Number:	289302	**Report Date:**	02/08/24

GLOSSARY

Acronyms

DL - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EMPC - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LOD - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

LOQ - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

NR - No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TEF - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.

TEQ - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2406353
Project Number:	289302	**Report Date:**	02/08/24

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2406353
Project Number:	289302	**Report Date:**	02/08/24

Data Qualifiers

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2406353
Project Number:	289302	**Report Date:**	02/08/24

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010 and WSC-CAM-IIIA and IIID, January 2024.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

141 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA and IIB, November 2021.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 2/6/24

ALPHA Job #: L2406393

ALPHA ANALYTICAL
8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220
320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Project Information

Project Name: Ledge Rd Landfill
Project Location: Andover, MA
Project #: 289362
Project Manager: Nathan Jones
ALPHA Quote #:

Report Information - Data Deliverables

☑ ADEx ☑ EMAIL

Billing Information

☑ Same as Client info PO #:

Client Information

Client: CDM Smith
Address: 75 State Street, Suite 701, Boston, MA 02109
Phone: 617-452-6563
Email: JonesNE@cdmsmith.com

Regulatory Requirements & Project Information Requirements

☑ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods
☐ Yes ☑ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☑ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☑ No NPDES RGP
☐ Other State /Fed Program _____ Criteria _____

Turn-Around Time

☐ Standard ☑ RUSH (only confirmed if pre-approved!)
Date Due:

Additional Project Information:

Detection limits for each parameter shall be less than reportable concentrations for RCS-1 criteria

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	VOC: ☑8260 ☐624 ☐524.2	SVOC: ☐ABN ☐PAH	METALS: ☐MCP 13 ☑MCP 14 ☐RCP 15	METALS: ☐RCRA5 ☐RCRA8 ☐PP13	EPH: ☐Ranges & Targets ☐Ranges Only	VPH: ☐Ranges & Targets ☐Ranges Only	☑PCB ☐PEST EPA 8082	TPH: ☐Quant Only ☐Fingerprint TPH - MassDEP method	PAHs - EPA 8270					Sample Comments	TOTAL # BOTTLES
06353 01	WRA-2	2/5/24	0955	Soil	ET	X		X				X		X	X					
02	WRA-1-S-2		1135					X												
03	WRA-1-S-1		1145					X												
04	WRA-1-N-5		1155					X												
05	WRA-1-N-4		1310					X												
06	WRA-1-N-3		1345					X												
07	WRA-1-N-2		1410					X												
08	WRA-1-N-1		1420					X												
09	WRA-1-S-5		1440					X												
10	WRA-1-S-3		1540					X												
	WRA-1-S-4		1550					X												

Container Type
Preservative

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H= $Na_2S_2O_3$
I= Ascorbic Acid
J= NH_4Cl
K= Zn Acetate
O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
Mylo Thompson	1122 2/6/24	DAVIS FAL 2	2-6-24 11:21
DAVIS FAL 2	2-6-24 14:30	DAVIS FAL 2	2/6/24 1430

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

Method Blank Summary
Form 4
Volatiles

Client	: CDM Smith, Inc.	**Lab Number**	: L2406353
Project Name	: LEDGE RD LANDFILL	**Project Number**	: 289302
Lab Sample ID	: WG1882758-5	**Lab File ID**	: V17240207B05
Instrument ID	: VOA117		
Matrix	: SOIL	**Analysis Date**	: 02/07/24 11:14

Client Sample No.	Lab Sample ID	Analysis Date
WG1882758-3LCS	WG1882758-3	02/07/24 09:29
WG1882758-4LCSD	WG1882758-4	02/07/24 09:55
WRA-2	L2406353-01	02/07/24 11:40

Calibration Verification Summary
Form 7
Volatiles

Client	: CDM Smith, Inc.	**Lab Number**	: L2406353
Project Name	: LEDGE RD LANDFILL	**Project Number**	: 289302
Instrument ID	: VOA117	**Calibration Date**	: 02/07/24 09:29
Lab File ID	: V17240207B01	**Init. Calib. Date(s)**	: 12/14/23 12/14/23
Sample No	: WG1882758-2	**Init. Calib. Times**	: 14:50 19:41
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
Fluorobenzene	1	1	-	0	20	108	0
Dichlorodifluoromethane	0.26	0.236	-	9.2	20	114	0
Chloromethane	0.245	0.262	-	-6.9	20	130	0
Vinyl chloride	0.35	0.293	-	16.3	20	100	0
Bromomethane	0.404	0.269	-	33.4*	20	82	0
Chloroethane	0.291	0.196	-	32.6*	20	86	0
Trichlorofluoromethane	0.628	0.444	-	29.3*	20	88	0
Ethyl ether	0.154	0.106	-	31.2*	20	80	0
1,1-Dichloroethene	0.355	0.257	-	27.6*	20	88	0
Carbon disulfide	1.215	0.862	-	29.1*	20	90	0
Freon-113	0.409	0.255	-	37.7*	20	79	0
Acrolein	0.017	0.016	-	5.9	20	111	0
Methylene chloride	0.221	0.22	-	0.5	20	132	0
Acetone	40	35.522	-	11.2	20	110	-.01
trans-1,2-Dichloroethene	0.219	0.246	-	-12.3	20	138	0
Methyl acetate	0.079	0.07	-	11.4	20	114	0
Methyl tert-butyl ether	0.435	0.421	-	3.2	20	113	0
tert-Butyl alcohol	0.012	0.01	-	16.7	20	102	0
Diisopropyl ether	0.544	0.548	-	-0.7	20	115	0
1,1-Dichloroethane	0.357	0.377	-	-5.6	20	126	0
Halothane	0.177	0.215	-	-21.5*	20	150	0
Acrylonitrile	0.032	0.031	-	3.1	20	110	-.01
Ethyl tert-butyl ether	0.511	0.492	-	3.7	20	111	0
Vinyl acetate	0.298	0.308	-	-3.4	20	119	0
cis-1,2-Dichloroethene	0.24	0.255	-	-6.3	20	125	0
2,2-Dichloropropane	0.3	0.346	-	-15.3	20	139	-.01
Bromochloromethane	0.109	0.127	-	-16.5	20	137	0
Cyclohexane	0.326	0.286	-	12.3	20	108	0
Chloroform	0.387	0.426	-	-10.1	20	130	0
Ethyl acetate	0.11	0.099	-	10	20	103	0
Carbon tetrachloride	0.307	0.395	-	-28.7*	20	153	0
Tetrahydrofuran	0.031	0.028	-	9.7	20	104	0
Dibromofluoromethane	0.261	0.282	-	-8	20	123	0
1,1,1-Trichloroethane	0.334	0.401	-	-20.1*	20	142	0
2-Butanone	0.049	0.04	-	18.4	20	105	0
1,1-Dichloropropene	0.274	0.303	-	-10.6	20	128	0
Benzene	0.79	0.839	-	-6.2	20	120	0
tert-Amyl methyl ether	0.467	0.419	-	10.3	20	99	0
1,2-Dichloroethane-d4	0.229	0.214	-	6.6	20	104	0
1,2-Dichloroethane	0.227	0.228	-	-0.4	20	112	0
Methyl cyclohexane	0.385	0.325	-	15.6	20	100	0
Trichloroethene	0.243	0.256	-	-5.3	20	122	0
Dibromomethane	0.112	0.117	-	-4.5	20	116	-.01

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: CDM Smith, Inc.	**Lab Number**	: L2406353
Project Name	: LEDGE RD LANDFILL	**Project Number**	: 289302
Instrument ID	: VOA117	**Calibration Date**	: 02/07/24 09:29
Lab File ID	: V17240207B01	**Init. Calib. Date(s)**	: 12/14/23 12/14/23
Sample No	: WG1882758-2	**Init. Calib. Times**	: 14:50 19:41
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
1,2-Dichloropropane	0.19	0.189	-	0.5	20	109	0
2-Chloroethyl vinyl ether	0.086	0.051	-	40.7*	20	65	0
Bromodichloromethane	0.266	0.294*	-	-10.5	20	118	0
1,4-Dioxane	0.0013	0.00125*	-	3.8	20	97	0
cis-1,3-Dichloropropene	0.276	0.307	-	-11.2	20	114	0
Chlorobenzene-d5	1	1	-	0	20	110	0
Toluene-d8	1.238	1.174	-	5.2	20	105	0
Toluene	0.665	0.675	-	-1.5	20	118	0
4-Methyl-2-pentanone	0.05	0.038	-	24*	20	84	-.01
Tetrachloroethene	0.305	0.354	-	-16.1	20	130	0
trans-1,3-Dichloropropene	40	38.324	-	4.2	20	113	0
Ethyl methacrylate	0.2	0.162	-	19	20	91	0
1,1,2-Trichloroethane	0.156	0.154*	-	1.3	20	109	0
Chlorodibromomethane	40	45.453	-	-13.6	20	123	0
1,3-Dichloropropane	0.301	0.299	-	0.7	20	107	-.01
1,2-Dibromoethane	0.181	0.189*	-	-4.4	20	109	0
2-Hexanone	0.088	0.067	-	23.9*	20	88	0
Chlorobenzene	0.788	0.829	-	-5.2	20	119	0
Ethylbenzene	1.324	1.332	-	-0.6	20	117	0
1,1,1,2-Tetrachloroethane	0.279	0.327	-	-17.2	20	125	0
p/m Xylene	0.527	0.556	-	-5.5	20	119	0
o Xylene	80	75.076	-	6.2	20	114	0
Styrene	80	80.584	-	-0.7	20	111	0
1,4-Dichlorobenzene-d4	1	1	-	0	20	110	0
Bromoform	40	39.382	-	1.5	20	123	0
Isopropylbenzene	2.363	2.415	-	-2.2	20	117	0
4-Bromofluorobenzene	0.695	0.701	-	-0.9	20	109	0
Bromobenzene	0.586	0.621	-	-6	20	119	0
n-Propylbenzene	2.769	2.773	-	-0.1	20	115	0
1,4-Dichlorobutane	0.449	0.409	-	8.9	20	103	0
1,1,2,2-Tetrachloroethane	0.391	0.37	-	5.4	20	102	0
4-Ethyltoluene	2.339	2.437	-	-4.2	20	118	0
2-Chlorotoluene	1.526	1.552	-	-1.7	20	116	0
1,3,5-Trimethylbenzene	2.032	2.07	-	-1.9	20	115	0
1,2,3-Trichloropropane	0.306	0.277	-	9.5	20	103	0
trans-1,4-Dichloro-2-buten	0.093	0.088	-	5.4	20	104	0
4-Chlorotoluene	1.582	1.613	-	-2	20	113	0
tert-Butylbenzene	1.851	1.927	-	-4.1	20	120	0
1,2,4-Trimethylbenzene	1.988	2.02	-	-1.6	20	113	0
sec-Butylbenzene	2.76	2.795	-	-1.3	20	116	0
p-Isopropyltoluene	2.415	2.539	-	-5.1	20	118	0
1,3-Dichlorobenzene	1.236	1.326	-	-7.3	20	120	0
1,4-Dichlorobenzene	1.258	1.321	-	-5	20	120	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: CDM Smith, Inc.		**Lab Number**	: L2406353	
Project Name	: LEDGE RD LANDFILL		**Project Number**	: 289302	
Instrument ID	: VOA117		**Calibration Date**	: 02/07/24 09:29	
Lab File ID	: V17240207B01		**Init. Calib. Date(s)**	: 12/14/23	12/14/23
Sample No	: WG1882758-2		**Init. Calib. Times**	: 14:50	19:41
Channel	:				

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
p-Diethylbenzene	1.509	1.568	-	-3.9	20	120	0
n-Butylbenzene	2.062	2.114	-	-2.5	20	114	0
1,2-Dichlorobenzene	1.131	1.199	-	-6	20	118	0
1,2,4,5-Tetramethylbenzene	2.281	2.338	-	-2.5	20	116	0
1,2-Dibromo-3-chloropropan	0.066	0.068	-	-3	20	114	0
1,3,5-Trichlorobenzene	0.889	1.032	-	-16.1	20	127	0
Hexachlorobutadiene	0.405	0.455	-	-12.3	20	131	0
1,2,4-Trichlorobenzene	0.744	0.83	-	-11.6	20	123	0
Naphthalene	1.575	1.504	-	4.5	20	109	0
1,2,3-Trichlorobenzene	0.661	0.73	-	-10.4	20	122	0

* Value outside of QC limits.

ANALYTICAL REPORT

Lab Number:	L2408857
Client:	CDM Smith, Inc. 75 State Street Suite 701 Boston, MA 02109
ATTN:	Nathan Jones
Phone:	(617) 452-6563
Project Name:	LEDGE RD LANDFILL
Project Number:	289302
Report Date:	02/23/24

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA030), NH NELAP (2062), CT (PH-0825), DoD (L2474), FL (E87814), IL (200081), IN (C-MA-04), KY (KY98046), LA (85084), ME (MA00030), MD (350), MI (99110) , NJ (MA015), NY (11627), NC (685), OH (CL106), OR (MA-0262), PA (68-02089), RI (LAO00299), TX (T104704419), VT (VT-0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #525-23-107-88708), USFWS (Permit #206964).

320 Forbes Boulevard, Mansfield, MA 02048-1806
508-822-9300 (Fax) 508-822-3288 800-624-9220 - www.alphalab.com

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2408857
Report Date: 02/23/24

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2408857-01	WRA-2	SOIL	ANDOVER, MA	02/05/24 09:55	02/06/24

Project Name: LEDGE RD LANDFILL **Lab Number:** L2408857

Project Number: 289302 **Report Date:** 02/23/24

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	YES
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	YES

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2408857
Project Number:	289302	**Report Date:**	02/23/24

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2408857
Project Number:	289302	**Report Date:**	02/23/24

Case Narrative (continued)

MCP Related Narratives

Report Submission

All MCP required questions were answered with affirmative responses; therefore, there are no relevant protocol-specific QC and/or performance standard non-conformances to report.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Kelly O'Neill

Title: Technical Director/Representative Date: 02/23/24

QC OUTLIER SUMMARY REPORT

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2408857
Report Date: 02/23/24

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment

There are no QC Outliers associated with this report.

ORGANICS

SEMIVOLATILES

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2408857
Report Date: 02/23/24

SAMPLE RESULTS

Lab ID: L2408857-01
Client ID: WRA-2
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 09:55
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8270E-SIM
Analytical Date: 02/20/24 15:38
Analyst: AMV
Percent Solids: 86%

Extraction Method: EPA 3570
Extraction Date: 02/19/24 22:26

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP 1,4 Dioxane by 8270E-SIM - Mansfield Lab						
1,4-Dioxane	ND		ug/kg	8.00	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,4-Dioxane-d8	84		15-110

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2408857
Report Date: 02/23/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E-SIM
Analytical Date: 02/20/24 13:14
Analyst: AMV

Extraction Method: EPA 3570
Extraction Date: 02/19/24 22:26

Parameter	Result	Qualifier	Units	RL	MDL
MCP 1,4 Dioxane by 8270E-SIM - Mansfield Lab for sample(s): 01 Batch: WG1886907-1					
1,4-Dioxane	ND		ug/kg	8.00	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,4-Dioxane-d8	81		15-110

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2408857

Report Date: 02/23/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP 1,4 Dioxane by 8270E-SIM - Mansfield Lab Associated sample(s): 01 Batch: WG1886907-2 WG1886907-3								
1,4-Dioxane	107		107		40-140	0		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,4-Dioxane-d8	81		82		15-110

INORGANICS
&
MISCELLANEOUS

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2408857
Report Date: 02/23/24

SAMPLE RESULTS

Lab ID: L2408857-01
Client ID: WRA-2
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 09:55
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	86.3		%	0.100	--	1	-	02/06/24 21:52	121,2540G	SJB

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2408857
Report Date: 02/23/24

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2408857-01A	Glass 60mL/2oz unpreserved	A	NA		4.3	Y	Absent		A2-MCP-14DX-SIM-21(14)

*Values in parentheses indicate holding time in days

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2408857
Project Number:	289302	**Report Date:**	02/23/24

GLOSSARY

Acronyms

DL - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EMPC - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LOD - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

LOQ - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

NR - No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TEF - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.

TEQ - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2408857
Project Number:	289302	**Report Date:**	02/23/24

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2408857
Project Number:	289302	**Report Date:**	02/23/24

Data Qualifiers

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2408857
Project Number:	289302	**Report Date:**	02/23/24

REFERENCES

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

141 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA and IIB, November 2021.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 2/16/24

ALPHA Job #: ~~L2406393~~

ALPHA ANALYTICAL
8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220
320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Client Information

Client: CDM Smith
Address: 75 State Street, Suite 701, Boston, MA 02109
Phone: 617-452-6563
Email: JonesNE@cdmsmith.com

Project Information

Project Name: Ledge Rd Landfill
Project Location: Andover, MA
Project #: 289362
Project Manager: Nathan Jones
ALPHA Quote #:

Turn-Around Time

☐ Standard ☑ RUSH (only confirmed if pre-approved!)
Date Due:

Report Information - Data Deliverables

☑ ADEx ☑ EMAIL

Billing Information

☑ Same as Client info PO #:

Regulatory Requirements & Project Information Requirements

☑ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods
☐ Yes ☑ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☑ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☑ No NPDES RGP
☐ Other State /Fed Program _____ Criteria _____

Additional Project Information:

Detection limits for each parameter shall be less than reportable concentrations for RCS-1 criteria

ANALYSIS

VOC: ☑8260 ☐624 ☐524.2
SVOC: ☐ABN ☐PAH
METALS: ☐MCP 13 ☑MCP 14 ☐RCP 15
METALS: ☐RCRA5 ☐RCRA8 ☐PP13
EPH: ☐Ranges & Targets ☐Ranges Only
VPH: ☐Ranges & Targets ☐Ranges Only
☑PCB ☐PEST EPA 8082
TPH: ☐Quant Only ☐Fingerprint TPH - MassDEP method
PAHs - EPA 8270

SAMPLE INFO

Filtration
☐ Field
☐ Lab to do
Preservation
☐ Lab to do

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	VOC	SVOC	METALS	METALS	EPH	VPH	PCB	TPH	TPH	PAHs	Sample Comments	TOTAL # BOTTLES
08857 ~~L2406393~~ 01	WRA-2	2/15/24	0955	Soil	ET	X		X				X		X	X	1,4-Dioxane SIM	
02	WRA-1-S-2		1135					X									
03	WRA-1-S-1		1145					X									
04	WRA-1-N-5		1155					X									
05	WRA-1-N-4		1310					X									
06	WRA-1-N-3		1340					X									
07	WRA-1-N-2		1410					X									
08	WRA-1-N-1		1420					X									
09	WRA-1-S-5		1440					X									
10	WRA-1-S-3		1540					X									
	WRA-1-S-4		1550					X									

Container Type
Preservative

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H= $Na_2S_2O_3$
I= Ascorbic Acid
J= NH_4Cl
K= Zn Acetate
O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
Mylo Thompson	1122 2/16/24	DAVIS FAL	2-16-24 11:21
DAVIS FAL	2-16-24 14:30	DAVIS ADT	2-16-24 11:21
			2/16/24 1430

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

Appendix E Wetland Soil Excavation Sample Results

XREFs: [CDMS_2436, Wetland Survey Dwg - WSP 9.2.15, Final_Grading-Working, Full Site Survey Revised 5.11.16, C0016RPL, C06AEXWP] Images: []
Last saved by: HEILR Time: 3/5/2023 2:25:28 PM
pw:\\cdmsmith-az02-pw.bentley.com:pw_p11\0235\113811\04 Design Services NM_100%\02 Civil\10 CADD\2022 Revision\C007-SRPL.dwg
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PROPOSED LEGEND

- AREAS DESIGNATED FOR REMOVAL BASED ON ARSENIC CONCENTRATIONS
- UPLAND TEMPORARY ACCESS ROUTES TO WETLAND SOIL REMOVAL AREAS. CONTRACTOR TO IMPROVE ACCESS ROUTES AS REQUIRED IN ORDER TO PERFORM THE WORK. CONTRACTOR SHALL RESTORE DISTURBED AREAS OUTSIDE OF CAP LIMITS TO EXISTING CONDITIONS.
- ANTICIPATED TIMBER MAT ACCESS TO WETLAND SOIL REMOVAL AREAS. CONTRACTOR TO REMOVE AND RESTORE AREA TO EXISTING CONDITIONS FOLLOWING WETLAND SOIL REMOVAL
- APPROXIMATE LOCATION OF TEMPORARY COFFER DAM. CONTRACTOR MAY PROPOSE ALTERNATIVE LOCATIONS
- PROPOSED HAUL ROUTE TO TOP OF LANDFILL AND WETLAND SOILS DRYING / DISPOSAL AREA. CONTRACTOR MAY PROPOSE ALTERNATIVE ROUTES.
- AREA DESIGNATED FOR WETLAND SOIL DRYING, AND FINAL DISPOSAL OF WETLAND SOILS AND RELOCATED WASTE

EXISTING LEGEND SEE SHEET G-2

- MATERIAL EXCAVATED OUTSIDE OF ORIGINALLY STAKED AREA DUE TO SAMPLE RESULTS OVER 900 MG/KG.

WETLAND SOIL REMOVAL AREA #5

WETLAND SOIL REMOVAL AREA #6

WETLAND SOIL REMOVAL AREA #4

WETLAND SOIL REMOVAL AREA #3

TEMPORARY ACCESS ROUTES FOR WETLAND SOILS REMOVAL IN UPLAND AREAS (TYP.)

PROPOSED HAUL ROUTE TO WETLAND SOILS AND RELOCATED WASTE DISPOSAL AREA

Berm of upland material not excavated

BENCHMARK: TBM-5
RAIL ROAD SPIKE SET IN BASE OF 18" PINE TREE.
ELEVATION = 154.32'

1" = 30'

REV. NO.	DATE	DRWN	CHKD	REMARKS
4	3/2023	JRH	NEJ	UPDATED FOR BIDDING
3	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE / DPW MATERIALS HANDLING AREA
2	1/2018	JRH	NEJ	REVISED TO RESPOND TO MASSDEP 12/14/2017 NOTICE OF TECHNICAL DEFICIENCY
1	3/2017	NEJ	MHL	REVISED TO RESPOND TO CONSERVATION COMMISSION PEER REVIEWER COMMENTS

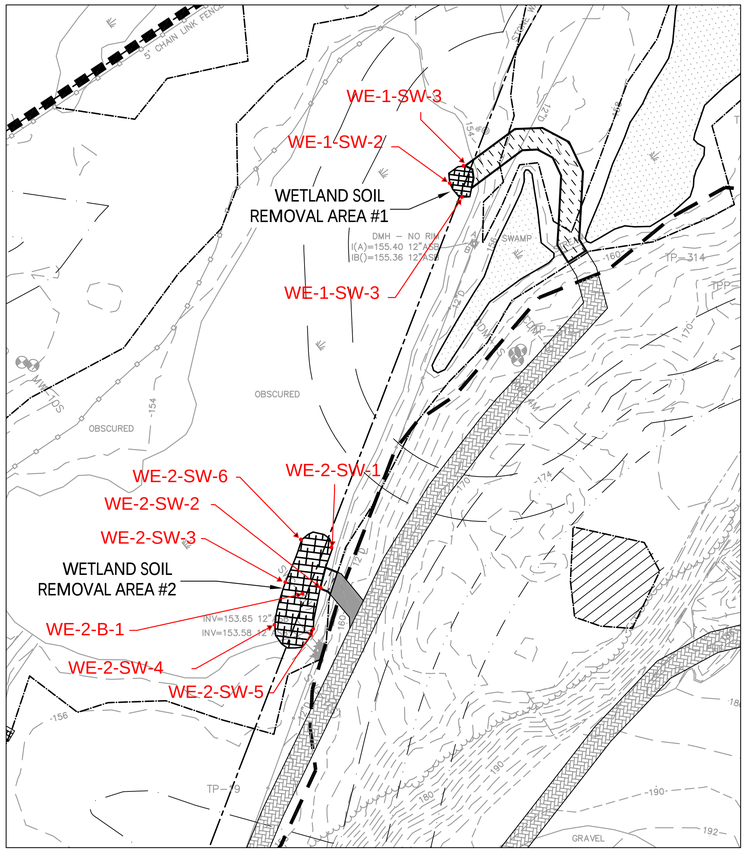
DESIGNED BY: E. SCHICK
DRAWN BY: E. SCHICK
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: MARCH 2023

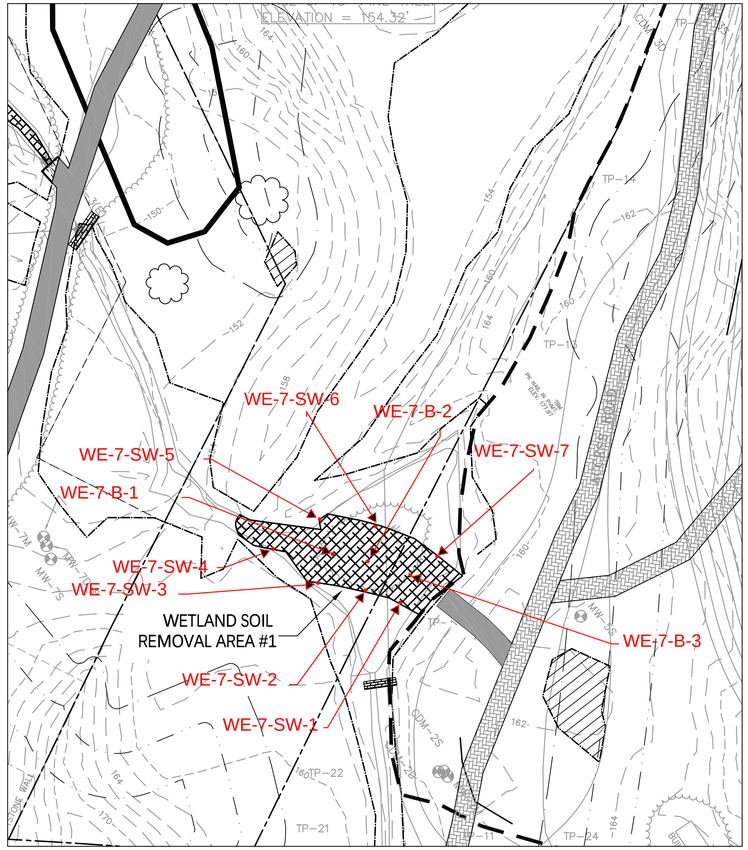
CDM Smith
75 State Street, Suite 701
Boston, MA 02109
Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

WETLAND SOILS REMEDIATION PLAN A
FIGURE 1

PROJECT NO. 0235-113811
FILE NAME: C007-SRPL.DWG
SHEET NO.





PROPOSED LEGEND

- AREAS DESIGNATED FOR REMOVAL BASED ON ARSENIC CONCENTRATIONS
- UPLAND TEMPORARY ACCESS ROUTES TO WETLAND SOIL REMOVAL AREAS. CONTRACTOR TO IMPROVE ACCESS ROUTES AS REQUIRED IN ORDER TO PERFORM THE WORK. CONTRACTOR SHALL RESTORE DISTURBED AREAS OUTSIDE OF CAP LIMITS TO EXISTING CONDITIONS.
- ANTICIPATED TIMBER MAT ACCESS TO WETLAND SOIL REMOVAL AREAS. CONTRACTOR TO REMOVE AND RESTORE AREA TO EXISTING CONDITIONS FOLLOWING WETLAND SOIL REMOVAL
- APPROXIMATE LOCATION OF TEMPORARY COFFER DAM. CONTRACTOR MAY PROPOSE ALTERNATIVE LOCATIONS
- PROPOSED HAUL ROUTE TO TOP OF LANDFILL AND WETLAND SOILS DRYING / DISPOSAL AREA. CONTRACTOR MAY PROPOSE ALTERNATIVE ROUTES.
- AREA DESIGNATED FOR WETLAND SOIL DRYING, AND FINAL DISPOSAL OF WETLAND SOILS AND RELOCATED WASTE

EXISTING LEGEND SEE SHEET G-2

REV. NO.	DATE	DRWN	CHKD	REMARKS
4	3/2023	JRH	NEJ	UPDATED FOR BIDDING
3	11/2022	KAR	NEJ	REMOVED POST-CLOSURE USE / DPW MATERIALS HANDLING AREA
2	1/2018	JRH	NEJ	REVISED TO RESPOND TO MASSDEP 12/14/2017 NOTICE OF TECHNICAL DEFICIENCY
1	3/2017	NEJ	MHL	REVISED TO RESPOND TO CONSERVATION COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY: E. SCHICK
DRAWN BY: E. SCHICK
SHEET CHK'D BY: C. GABEL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: MARCH 2023

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TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

WETLAND SOILS REMEDIATION PLAN B
FIGURE 2

PROJECT NO. 0235-113811
FILE NAME: C007-SRPL.DWG
SHEET NO.

XREFs: [CDMS_2436_Wetland Survey Dwg - WSP 9.2.15, Final_Grading-Working, Full Site Survey Revised 5.11.16, C001GRPL, C06AEXWP] Images: []
Last saved by: HELiR Time: 3/5/2023 2:25:28 PM
pw:\\cdmsmith-az02-pw.bentley.com:pw_pr1\0235\113811\04 Design Services NM_100%\02 Civil\10 CADD\2022 Revision\C007-SRPL.dwg
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Table 1: Wetland Soil Removal Area 1 Confirmation Sample Results
Ledge Road Landfill Closure
Andover, MA

CLIENT SAMPLE ID	SAMPLING DATE	LAB SAMPLE ID	Solids, Total (%)	Arsenic, Total (mg/kg)
WE-1-SW-1	04-MAR-24	L2411876-01	58.2	4.72
WE-1-SW-2	04-MAR-24	L2411876-02	10.9	67.2
WE-1-SW-3	04-MAR-24	L2411876-03	9.63	138
WE-1-B-1	05-MAR-24	L2411876-04	30.6	43.3
DUPE-1 (WE-1-B-1)	05-MAR-24	L2411876-05	53.1	45.3

Notes:
- Arsenic results are compared to a Site-Secific Cleanup Standard of 900 mg/kg, which was approved by MassDEP with along with the CAAA in 2012.
- Green highlighted cells indicate sample results exceeding the 900 mg/kg Site-Specific Cleanup Standard.

Table 2: Wetland Soil Removal Area 2 Confirmation Sample Results
Ledge Road Landfill Closure
Andover, MA

CLIENT SAMPLE ID	SAMPLING DATE	LAB SAMPLE ID	Solids, Total (%)	Arsenic, Total (mg/kg)
WE-2-SW-1	05-MAR-24	L2411876-06	44.8	13.6
WE-2-SW-2	05-MAR-24	L2411876-07	33.4	219
WE-2-SW-3	05-MAR-24	L2411876-08	14	45.9
WE-2-SW-4	05-MAR-24	L2411876-09	57.2	15.7
WE-2-SW-5	05-MAR-24	L2411876-10	33.4	66.4
WE-2-SW-6	05-MAR-24	L2411876-11	34.9	20.8
WE-2-B-1	05-MAR-24	L2411876-12	29.5	45.4
DUPE-2 (WE-2-B-1)	05-MAR-24	L2411876-20	36.6	40.9

Notes:
- Arsenic results are compared to a Site-Secific Cleanup Standard of 900 mg/kg, which was approved by MassDEP with along with the CAAA in 2012.
- Green highlighted cells indicate sample results exceeding the 900 mg/kg Site-Specific Cleanup Standard.

Table 3: Wetland Soil Removal Area 3 Confirmation Sample Results
Ledge Road Landfill Closure
Andover, MA

CLIENT SAMPLE ID	SAMPLING DATE	LAB SAMPLE ID	Solids, Total (%)	Arsenic, Total (mg/kg)
WE-3-SW-1	05-MAR-24	L2411876-13	17.5	46.6
WE-3-SW-2	05-MAR-24	L2411876-14	11.5	182
WE-3-SW-3	05-MAR-24	L2411876-15	13.6	49.5
DUPE-3 (WE-3-SW-3)	05-MAR-24	L2411876-16	12.4	39.6
WE-3-SW-4	05-MAR-24	L2411876-17	30	80.8
WE-3-B-1	05-MAR-24	L2411876-18	29.6	42.6
WE-3-B-2	05-MAR-24	L2411876-19	63.9	130
WE-3-SW-5[1]	11-MAR-24	L2413165-01	22.4	2380
WE-3-SW-5A	01-APR-24	L2417561-01	28.1	372
WE-3-SW-6[1]	11-MAR-24	L2413165-02	28.7	1710
WE-3-SW-7	11-MAR-24	L2413165-03	26.2	223
WE-3-SW-8	11-MAR-24	L2413165-04	28.5	266
WE-3-SW-9	11-MAR-24	L2413165-05	20.6	632
WE-3-SW-10	11-MAR-24	L2413165-06	37.6	524
WE-3-SW-11	11-MAR-24	L2413165-07	13.9	386
WE-3-B-3	11-MAR-24	L2413165-08	28	203
WE-3-B-4	11-MAR-24	L2413165-09	27.8	134

Notes:
- Arsenic results are compared to a Site-Secific Cleanup Standard of 900 mg/kg, which was approved by MassDEP with along with the CAAA in 2012.
- Green highlighted cells indicate sample results exceeding the 900 mg/kg Site-Specific Cleanup Standard.
1. Soil associated with sample was removed by subsequent excavation.

Table 4: Wetland Soil Removal Area 4 Confirmation Sample Results
Ledge Road Landfill Closure
Andover, MA

CLIENT SAMPLE ID	SAMPLING DATE	LAB SAMPLE ID	Solids, Total (%)	Arsenic, Total (mg/kg)
WE-4-B-1	25-MAR-24	L2416131-01	51.1	79.2
WE-4-B-2	25-MAR-24	L2416131-02	41.1	49.3
WE-4-B-3	25-MAR-24	L2416131-03	52.9	92.2
WE-4-B-4	25-MAR-24	L2416131-04	76.2	11.6
WE-4-B-5	25-MAR-24	L2416131-05	71.7	17.1
WE-4-B-6	25-MAR-24	L2416131-06	73.4	24

Notes:
- Arsenic results are compared to a Site-Secific Cleanup Standard of 900 mg/kg, which was approved by MassDEP with along with the CAAA in 2012.
- Green highlighted cells indicate sample results exceeding the 900 mg/kg Site-Specific Cleanup Standard.

Table 5: Wetland Soil Removal Area 5 Confirmation Sample Results
Ledge Road Landfill Closure
Andover, MA

CLIENT SAMPLE ID	SAMPLING DATE	LAB SAMPLE ID	Solids, Total (%)	Arsenic, Total (%)
WE-5-SW-1	12-MAR-24	L2414089-01	18.6	487
DUPE 5 (WE-5-SW-1)	12-MAR-24	L2414089-09	20	364
WE-5-SW-2	12-MAR-24	L2414089-02	15.9	708
WE-5-SW-2A	18-MAR-24	L2414646-01	11.4	111
WE-5-SW-3[1]	12-MAR-24	L2414089-03	13.9	2500
WE-5-SW-3A[1]	18-MAR-24	L2414646-02	14.1	1260
WE-5-SW-3B[1]	18-MAR-24	NA	NA	NA
WE-5-SW-3C (0-0.5)	20-MAR-24	L2415255-01	12.6	512
WE-5-SW-3D (0-0.5)	20-MAR-24	L2415255-02	14.1	248
WE-5-SW-4	12-MAR-24	L2414089-04	19.8	97.9
WE-5-SW-5	12-MAR-24	L2414089-05	16.8	2270
WE-5-SW-5A[1]	18-MAR-24	L2414646-03	19.6	1280
WE-5-SW-5-B[1]	19-MAR-24	L2414978-19	17.3	2700
WE-5-SW-5C (0-0.5)	20-MAR-24	L2415255-03	18.4	213
WE-5-SW-5D (0-0.5)	20-MAR-24	L2415255-04	20.1	739
WE-5-SW-6	12-MAR-24	L2414089-06	15.7	1290
WE-5-SW-6A[1]	18-MAR-24	L2414646-04	21.5	2820
WE-5-SW-6-B[1]	19-MAR-24	L2414978-20	25.7	1100
WE-5-SW-6C (0-0.5)[1]	20-MAR-24	L2415255-06	14	630
WE-5-SW-6D (0-0.5)[1]	20-MAR-24	L2415255-07	21.1	78.2
WE-5-SW-7	12-MAR-24	L2414089-07	25.8	44.7
WE-5-SW-8	12-MAR-24	L2414089-08	23.6	372
WE-5-B-1	12-MAR-24	L2414089-10	38.9	99.6
WE-5-B-2	12-MAR-24	L2414089-11	16.8	596
WE-5-B-3[1]	12-MAR-24	L2414089-12	21.7	1840
DUPE 6 (WE-5-B-3)	12-MAR-24	L2414089-15	22.8	820
WE-5-B-3-1	19-MAR-24	L2414978-10	62	142
WE-5-B-3-2	19-MAR-24	L2414978-11	62	150
WE-5-B-3-3	19-MAR-24	L2414978-12	47.9	62.4
WE-5-B-3-E (1-1.5)	20-MAR-24	L2415255-10	60.6	9.57
WE-5-B-3-W (1-1.5)[1]	20-MAR-24	L2415255-11	32.9	110

Table 5: Wetland Soil Removal Area 5 Confirmation Sample Results
Ledge Road Landfill Closure
Andover, MA

CLIENT SAMPLE ID	SAMPLING DATE	LAB SAMPLE ID	Solids, Total (%)	Arsenic, Total (%)
WE-5-B-4	12-MAR-24	L2414089-13	27	220
WE-5-B-5	12-MAR-24	L2414089-14	29.5	229
WE-5-BSW-1	18-MAR-24	L2414646-05	72.8	130
WE-5-BSW-2[1]	18-MAR-24	L2414646-06	28.5	984
WE-5-BSW-2-R (0-0.5)	20-MAR-24	L2415255-12	31.7	1070
WE-5-BSW-REDO	26-MAR-24	L2416554-01	59.7	205
WE-5-SW-21	18-MAR-24	L2414646-07	18.8	465
WE-5-SW-20	18-MAR-24	L2414646-08	34.4	120
DUPE 7 (WE-5-SW-20)	18-MAR-24	L2414646-14	31.2	116
WE-5-SW-19	18-MAR-24	L2414646-09	36.2	149
WE-5-SW-18	18-MAR-24	L2414646-10	26.5	271
WE-5-SW-17	18-MAR-24	L2414646-11	27.8	171
WE-5-SW-16	18-MAR-24	L2414646-12	42.8	76.8
WE-5-SW-15	18-MAR-24	L2414646-13	24.5	196
WE-5-B-6	19-MAR-24	L2414978-01	47.5	99.8
WE-5-B-7	19-MAR-24	L2414978-02	68.4	45
WE-5-B-8	19-MAR-24	L2414978-03	75.6	63.3
WE-5-B-9	19-MAR-24	L2414978-04	66.7	52
WE-5-B-10	19-MAR-24	L2414978-05	67.2	56.6
WE-5-B-11	19-MAR-24	L2414978-06	70	91.2
WE-5-B-12	19-MAR-24	L2414978-07	67.3	22
WE-5-B-13	19-MAR-24	L2414978-08	75.2	19.1
WE-5-B-14	19-MAR-24	L2414978-09	65.1	39.5
WE-5-SW-14	19-MAR-24	L2414978-13	39.5	78.5
DUPE 8 (WE-5-SW-14)	19-MAR-24	L2414978-21	47.9	60.7
WE-5-SW-13	19-MAR-24	L2414978-14	34.4	62
WE-5-SW-12	19-MAR-24	L2414978-15	18.7	424
WE-5-SW-11	19-MAR-24	L2414978-16	43.1	228
WE-5-SW-10	19-MAR-24	L2414978-17	27.9	134
WE-5-SW-9	19-MAR-24	L2414978-18	33.7	267

Notes:
- Arsenic results are compared to a Site-Secific Cleanup Standard of 900 mg/kg, which was approved by MassDEP with along with the CAAA in 2012.
- Green highlighted cells indicate sample results exceeding the 900 mg/kg Site-Specific Cleanup Standard.
1. Soil associated with sample was removed by subsequent excavation.
NA: WE-5-SW-3B was collected as a possible delineation point between WE-5-SW-3A and WE-5-SW-3 but was not analyzed as WE-5-SW-3A exceeded 900 mg/kg.

Table 6: Wetland Soil Removal Area 6 Confirmation Sample Results
Ledge Road Landfill Closure
Andover, MA

CLIENT SAMPLE ID	SAMPLING DATE	LAB SAMPLE ID	Solids, Total (%)	Arsenic, Total (mg/kg)
WE-6-B-1	21-MAR-24	L2415698-01	67.9	200
WE-6-B-2	21-MAR-24	L2415698-02	73.7	17.6
WE-6-B-3	21-MAR-24	L2415698-03	48.6	162
DUPE 9 (WE-6-B-3)	21-MAR-24	L2415698-17	47.9	192
WE-6-B-4	21-MAR-24	L2415698-04	50.9	73.3
WE-6-B-5	21-MAR-24	L2415698-05	39.6	534
WE-6-B-6	21-MAR-24	L2415698-06	69.4	35.2
WE-6-B-7	21-MAR-24	L2415698-07	69.9	37.9
WE-6-B-8	21-MAR-24	L2415698-08	65.5	103
WE-6-B-9	21-MAR-24	L2415698-09	50.5	153
WE-6-B-10	21-MAR-24	L2415698-10	63.6	58.2
WE-6-B-11	21-MAR-24	L2415698-11	60.3	102
WE-6-B-12	21-MAR-24	L2415698-12	49	98.6
WE-6-B-13	21-MAR-24	L2415698-13	58.4	70.8
WE-6-B-14	21-MAR-24	L2415698-14	61	306
WE-6-B-15	21-MAR-24	L2415698-15	57.3	217
WE-6-B-16	21-MAR-24	L2415698-16	78.2	49.6

Notes:
- Arsenic results are compared to a Site-Secific Cleanup Standard of 900 mg/kg, which was approved by MassDEP with along with the CAAA in 2012.
- Green highlighted cells indicate sample results exceeding the 900 mg/kg Site-Specific Cleanup Standard.

Table 7: Wetland Soil Removal Area 7 Confirmation Sample Results
Ledge Road Landfill Closure
Andover, MA

CLIENT SAMPLE ID	SAMPLING DATE	LAB SAMPLE ID	Solids, Total (%)	Arsenic, Total (mg/kg)
WE-7-SW-1	12-MAR-24	L2413393-01	74.5	17.4
DUPE-4 (WE-7-SW-1)	12-MAR-24	L2413393-08	69.6	15.6
WE-7-SW-2	12-MAR-24	L2413393-02	47.4	56.4
WE-7-SW-3	12-MAR-24	L2413393-03	33.9	81.7
WE-7-SW-4	12-MAR-24	L2413393-04	62.7	6.46
WE-7-SW-5	12-MAR-24	L2413393-05	41.5	11.8
WE-7-SW-6	12-MAR-24	L2413393-06	44.9	117
WE-7-SW-7	12-MAR-24	L2413393-07	27.1	268
WE-7-B-1	12-MAR-24	L2413393-09	37.2	150
WE-7-B-2	12-MAR-24	L2413393-10	39	350
WE-7-B-3	12-MAR-24	L2413393-11	42.1	379

Notes:
- Arsenic results are compared to a Site-Secific Cleanup Standard of 900 mg/kg, which was approved by MassDEP with along with the CAAA in 2012.
- Green highlighted cells indicate sample results exceeding the 900 mg/kg Site-Specific Cleanup Standard.

ANALYTICAL REPORT

Lab Number:	L2400193
Client:	CDM Smith, Inc. 75 State Street Suite 701 Boston, MA 02109
ATTN:	Nathan Jones
Phone:	(617) 452-6563
Project Name:	LEDGE RD LANDFILL
Project Number:	289302
Report Date:	01/12/24

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Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2400193
Report Date: 01/12/24

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2400193-01	WRA-5	SOIL	ANDOVER, MA	01/02/24 13:30	01/03/24

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400193

Project Number: 289302 **Report Date:** 01/12/24

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	NO

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2400193
Project Number:	289302	**Report Date:**	01/12/24

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2400193
Project Number:	289302	**Report Date:**	01/12/24

Case Narrative (continued)

Report Submission

January 12, 2024: This final report includes the results of all requested analyses.

January 05, 2024: This is a preliminary report.

MCP Related Narratives

Sample Receipt

In reference to question H:

A Matrix Spike was not submitted for the analysis of Total Metals..

Volatile Organics

L2400193-01: Initial calibration utilized a quadratic fit for: 1,1,1,2-tetrachloroethane

In reference to question H:

L2400193-01: Initial Calibration did not meet:

Lowest Calibration Standard Minimum Response Factor: trichloroethene (0.1904), bromodichloromethane (0.2472), 1,4-dioxane (0.0032), cis-1,3-dichloropropene (0.2490)

Average Response Factor: 1,4-dioxane

Verification: dichlorodifluoromethane (62%)

L2400193-01: The associated continuing calibration standard is outside the acceptance criteria for several compounds; however, it is within overall method allowances. Associated results are considered to be biased high if the %D is negative and biased low if the %D is positive. A copy of the continuing calibration standard is included as an addendum to this report.

PAHs

In reference to question I:

All samples were analyzed for a subset of MCP analytes per client request.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Cristin Walker

Title: Technical Director/Representative Date: 01/12/24

QC OUTLIER SUMMARY REPORT

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2400193
Report Date: 01/12/24

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment
MCP Volatile Organics by EPA 5035 Low - Westborough Lab								
8260D	Batch QC	WG1871046-3	Dichlorodifluoromethane	LCS	50	70-130	01	potential low bias
8260D	Batch QC	WG1871046-3	Diisopropyl Ether	LCS	140	70-130	01	potential high bias
8260D	Batch QC	WG1871046-4	Dichlorodifluoromethane	LCSD	48	70-130	01	potential low bias
8260D	Batch QC	WG1871046-4	Acetone	LCSD	29	20	01	non-directional bias

ORGANICS

VOLATILES

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400193

Project Number: 289302 **Report Date:** 01/12/24

SAMPLE RESULTS

Lab ID: L2400193-01 Date Collected: 01/02/24 13:30
Client ID: WRA-5 Date Received: 01/03/24
Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8260D
Analytical Date: 01/04/24 11:04
Analyst: AJK
Percent Solids: 87%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Methylene chloride	ND		ug/kg	18	--	1
1,1-Dichloroethane	ND		ug/kg	3.6	--	1
Chloroform	ND		ug/kg	5.4	--	1
Carbon tetrachloride	ND		ug/kg	3.6	--	1
1,2-Dichloropropane	ND		ug/kg	3.6	--	1
Dibromochloromethane	ND		ug/kg	3.6	--	1
1,1,2-Trichloroethane	ND		ug/kg	3.6	--	1
Tetrachloroethene	ND		ug/kg	1.8	--	1
Chlorobenzene	ND		ug/kg	1.8	--	1
Trichlorofluoromethane	ND		ug/kg	14	--	1
1,2-Dichloroethane	ND		ug/kg	3.6	--	1
1,1,1-Trichloroethane	ND		ug/kg	1.8	--	1
Bromodichloromethane	ND		ug/kg	1.8	--	1
trans-1,3-Dichloropropene	ND		ug/kg	3.6	--	1
cis-1,3-Dichloropropene	ND		ug/kg	1.8	--	1
1,3-Dichloropropene, Total	ND		ug/kg	1.8	--	1
1,1-Dichloropropene	ND		ug/kg	1.8	--	1
Bromoform	ND		ug/kg	14	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.8	--	1
Benzene	ND		ug/kg	1.8	--	1
Toluene	ND		ug/kg	3.6	--	1
Ethylbenzene	ND		ug/kg	3.6	--	1
Chloromethane	ND		ug/kg	14	--	1
Bromomethane	ND		ug/kg	7.2	--	1
Vinyl chloride	ND		ug/kg	3.6	--	1
Chloroethane	ND		ug/kg	7.2	--	1
1,1-Dichloroethene	ND		ug/kg	3.6	--	1
trans-1,2-Dichloroethene	ND		ug/kg	5.4	--	1

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400193

Project Number: 289302 **Report Date:** 01/12/24

SAMPLE RESULTS

Lab ID: L2400193-01 Date Collected: 01/02/24 13:30
Client ID: WRA-5 Date Received: 01/03/24
Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Trichloroethene	ND		ug/kg	1.8	--	1
1,2-Dichlorobenzene	ND		ug/kg	7.2	--	1
1,3-Dichlorobenzene	ND		ug/kg	7.2	--	1
1,4-Dichlorobenzene	ND		ug/kg	7.2	--	1
Methyl tert butyl ether	ND		ug/kg	7.2	--	1
p/m-Xylene	ND		ug/kg	7.2	--	1
o-Xylene	ND		ug/kg	3.6	--	1
Xylenes, Total	ND		ug/kg	3.6	--	1
cis-1,2-Dichloroethene	ND		ug/kg	3.6	--	1
1,2-Dichloroethene, Total	ND		ug/kg	3.6	--	1
Dibromomethane	ND		ug/kg	7.2	--	1
1,2,3-Trichloropropane	ND		ug/kg	7.2	--	1
Styrene	ND		ug/kg	3.6	--	1
Dichlorodifluoromethane	ND		ug/kg	36	--	1
Acetone	ND		ug/kg	90	--	1
Carbon disulfide	ND		ug/kg	36	--	1
Methyl ethyl ketone	ND		ug/kg	36	--	1
Methyl isobutyl ketone	ND		ug/kg	36	--	1
2-Hexanone	ND		ug/kg	36	--	1
Bromochloromethane	ND		ug/kg	7.2	--	1
Tetrahydrofuran	ND		ug/kg	14	--	1
2,2-Dichloropropane	ND		ug/kg	7.2	--	1
1,2-Dibromoethane	ND		ug/kg	3.6	--	1
1,3-Dichloropropane	ND		ug/kg	7.2	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.8	--	1
Bromobenzene	ND		ug/kg	7.2	--	1
n-Butylbenzene	ND		ug/kg	3.6	--	1
sec-Butylbenzene	ND		ug/kg	3.6	--	1
tert-Butylbenzene	ND		ug/kg	7.2	--	1
o-Chlorotoluene	ND		ug/kg	7.2	--	1
p-Chlorotoluene	ND		ug/kg	7.2	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	11	--	1
Hexachlorobutadiene	ND		ug/kg	14	--	1
Isopropylbenzene	ND		ug/kg	3.6	--	1
p-Isopropyltoluene	ND		ug/kg	3.6	--	1
Naphthalene	ND		ug/kg	14	--	1
n-Propylbenzene	ND		ug/kg	3.6	--	1

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400193

Project Number: 289302 **Report Date:** 01/12/24

SAMPLE RESULTS

Lab ID: L2400193-01 Date Collected: 01/02/24 13:30

Client ID: WRA-5 Date Received: 01/03/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	7.2	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	7.2	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	7.2	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	7.2	--	1
Diethyl ether	ND		ug/kg	7.2	--	1
Diisopropyl Ether	ND		ug/kg	7.2	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	7.2	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	7.2	--	1
1,4-Dioxane	ND		ug/kg	290	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	112		70-130
Toluene-d8	96		70-130
4-Bromofluorobenzene	100		70-130
Dibromofluoromethane	98		70-130

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400193

Project Number: 289302 **Report Date:** 01/12/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 01/04/24 09:41
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1871046-5					
Methylene chloride	ND		ug/kg	5.0	--
1,1-Dichloroethane	ND		ug/kg	1.0	--
Chloroform	ND		ug/kg	1.5	--
Carbon tetrachloride	ND		ug/kg	1.0	--
1,2-Dichloropropane	ND		ug/kg	1.0	--
Dibromochloromethane	ND		ug/kg	1.0	--
1,1,2-Trichloroethane	ND		ug/kg	1.0	--
Tetrachloroethene	ND		ug/kg	0.50	--
Chlorobenzene	ND		ug/kg	0.50	--
Trichlorofluoromethane	ND		ug/kg	4.0	--
1,2-Dichloroethane	ND		ug/kg	1.0	--
1,1,1-Trichloroethane	ND		ug/kg	0.50	--
Bromodichloromethane	ND		ug/kg	0.50	--
trans-1,3-Dichloropropene	ND		ug/kg	1.0	--
cis-1,3-Dichloropropene	ND		ug/kg	0.50	--
1,3-Dichloropropene, Total	ND		ug/kg	0.50	--
1,1-Dichloropropene	ND		ug/kg	0.50	--
Bromoform	ND		ug/kg	4.0	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.50	--
Benzene	ND		ug/kg	0.50	--
Toluene	ND		ug/kg	1.0	--
Ethylbenzene	ND		ug/kg	1.0	--
Chloromethane	ND		ug/kg	4.0	--
Bromomethane	ND		ug/kg	2.0	--
Vinyl chloride	ND		ug/kg	1.0	--
Chloroethane	ND		ug/kg	2.0	--
1,1-Dichloroethene	ND		ug/kg	1.0	--
trans-1,2-Dichloroethene	ND		ug/kg	1.5	--
Trichloroethene	ND		ug/kg	0.50	--

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400193

Project Number: 289302 **Report Date:** 01/12/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 01/04/24 09:41
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1871046-5					
1,2-Dichlorobenzene	ND		ug/kg	2.0	--
1,3-Dichlorobenzene	ND		ug/kg	2.0	--
1,4-Dichlorobenzene	ND		ug/kg	2.0	--
Methyl tert butyl ether	ND		ug/kg	2.0	--
p/m-Xylene	ND		ug/kg	2.0	--
o-Xylene	ND		ug/kg	1.0	--
Xylenes, Total	ND		ug/kg	1.0	--
cis-1,2-Dichloroethene	ND		ug/kg	1.0	--
1,2-Dichloroethene, Total	ND		ug/kg	1.0	--
Dibromomethane	ND		ug/kg	2.0	--
1,2,3-Trichloropropane	ND		ug/kg	2.0	--
Styrene	ND		ug/kg	1.0	--
Dichlorodifluoromethane	ND		ug/kg	10	--
Acetone	ND		ug/kg	25	--
Carbon disulfide	ND		ug/kg	10	--
Methyl ethyl ketone	ND		ug/kg	10	--
Methyl isobutyl ketone	ND		ug/kg	10	--
2-Hexanone	ND		ug/kg	10	--
Bromochloromethane	ND		ug/kg	2.0	--
Tetrahydrofuran	ND		ug/kg	4.0	--
2,2-Dichloropropane	ND		ug/kg	2.0	--
1,2-Dibromoethane	ND		ug/kg	1.0	--
1,3-Dichloropropane	ND		ug/kg	2.0	--
1,1,1,2-Tetrachloroethane	ND		ug/kg	0.50	--
Bromobenzene	ND		ug/kg	2.0	--
n-Butylbenzene	ND		ug/kg	1.0	--
sec-Butylbenzene	ND		ug/kg	1.0	--
tert-Butylbenzene	ND		ug/kg	2.0	--
o-Chlorotoluene	ND		ug/kg	2.0	--

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400193

Project Number: 289302 **Report Date:** 01/12/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 01/04/24 09:41
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1871046-5					
p-Chlorotoluene	ND		ug/kg	2.0	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	3.0	--
Hexachlorobutadiene	ND		ug/kg	4.0	--
Isopropylbenzene	ND		ug/kg	1.0	--
p-Isopropyltoluene	ND		ug/kg	1.0	--
Naphthalene	ND		ug/kg	4.0	--
n-Propylbenzene	ND		ug/kg	1.0	--
1,2,3-Trichlorobenzene	ND		ug/kg	2.0	--
1,2,4-Trichlorobenzene	ND		ug/kg	2.0	--
1,3,5-Trimethylbenzene	ND		ug/kg	2.0	--
1,2,4-Trimethylbenzene	ND		ug/kg	2.0	--
Diethyl ether	ND		ug/kg	2.0	--
Diisopropyl Ether	ND		ug/kg	2.0	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	2.0	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	2.0	--
1,4-Dioxane	ND		ug/kg	80	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	112		70-130
Toluene-d8	94		70-130
4-Bromofluorobenzene	96		70-130
Dibromofluoromethane	97		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2400193

Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1871046-3 WG1871046-4								
Methylene chloride	85		93		70-130	9		20
1,1-Dichloroethane	103		92		70-130	11		20
Chloroform	87		89		70-130	2		20
Carbon tetrachloride	87		88		70-130	1		20
1,2-Dichloropropane	97		98		70-130	1		20
Dibromochloromethane	88		97		70-130	10		20
1,1,2-Trichloroethane	90		96		70-130	6		20
Tetrachloroethene	85		86		70-130	1		20
Chlorobenzene	87		90		70-130	3		20
Trichlorofluoromethane	85		82		70-130	4		20
1,2-Dichloroethane	93		97		70-130	4		20
1,1,1-Trichloroethane	88		89		70-130	1		20
Bromodichloromethane	92		96		70-130	4		20
trans-1,3-Dichloropropene	83		91		70-130	9		20
cis-1,3-Dichloropropene	89		94		70-130	5		20
1,1-Dichloropropene	94		92		70-130	2		20
Bromoform	78		92		70-130	16		20
1,1,2,2-Tetrachloroethane	88		101		70-130	14		20
Benzene	91		90		70-130	1		20
Toluene	86		88		70-130	2		20
Ethylbenzene	90		93		70-130	3		20
Chloromethane	90		87		70-130	3		20
Bromomethane	83		79		70-130	5		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2400193
Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1871046-3 WG1871046-4								
Vinyl chloride	84		82		70-130	2		20
Chloroethane	95		92		70-130	3		20
1,1-Dichloroethene	82		82		70-130	0		20
trans-1,2-Dichloroethene	86		89		70-130	3		20
Trichloroethene	93		93		70-130	0		20
1,2-Dichlorobenzene	86		93		70-130	8		20
1,3-Dichlorobenzene	87		90		70-130	3		20
1,4-Dichlorobenzene	85		89		70-130	5		20
Methyl tert butyl ether	89		99		70-130	11		20
p/m-Xylene	90		92		70-130	2		20
o-Xylene	89		92		70-130	3		20
cis-1,2-Dichloroethene	82		83		70-130	1		20
Dibromomethane	83		88		70-130	6		20
1,2,3-Trichloropropane	86		96		70-130	11		20
Styrene	92		95		70-130	3		20
Dichlorodifluoromethane	**50**	Q	**48**	Q	70-130	4		20
Acetone	83		111		70-130	**29**	Q	20
Carbon disulfide	80		81		70-130	1		20
Methyl ethyl ketone	82		96		70-130	16		20
Methyl isobutyl ketone	86		101		70-130	16		20
2-Hexanone	91		111		70-130	20		20
Bromochloromethane	79		81		70-130	3		20
Tetrahydrofuran	83		96		70-130	15		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2400193
Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1871046-3 WG1871046-4								
2,2-Dichloropropane	76		77		70-130	1		20
1,2-Dibromoethane	88		96		70-130	9		20
1,3-Dichloropropane	90		97		70-130	7		20
1,1,1,2-Tetrachloroethane	78		85		70-130	9		20
Bromobenzene	84		88		70-130	5		20
n-Butylbenzene	99		100		70-130	1		20
sec-Butylbenzene	93		96		70-130	3		20
tert-Butylbenzene	90		93		70-130	3		20
o-Chlorotoluene	104		106		70-130	2		20
p-Chlorotoluene	92		94		70-130	2		20
1,2-Dibromo-3-chloropropane	74		90		70-130	20		20
Hexachlorobutadiene	81		82		70-130	1		20
Isopropylbenzene	92		94		70-130	2		20
p-Isopropyltoluene	93		94		70-130	1		20
Naphthalene	82		94		70-130	14		20
n-Propylbenzene	94		97		70-130	3		20
1,2,3-Trichlorobenzene	85		92		70-130	8		20
1,2,4-Trichlorobenzene	91		95		70-130	4		20
1,3,5-Trimethylbenzene	91		94		70-130	3		20
1,2,4-Trimethylbenzene	92		95		70-130	3		20
Diethyl ether	88		93		70-130	6		20
Diisopropyl Ether	**140**	Q	115		70-130	20		20
Ethyl-Tert-Butyl-Ether	96		99		70-130	3		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2400193

Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1871046-3 WG1871046-4								
Tertiary-Amyl Methyl Ether	81		87		70-130	7		20
1,4-Dioxane	75		87		70-130	15		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	104		104		70-130
Toluene-d8	96		97		70-130
4-Bromofluorobenzene	97		97		70-130
Dibromofluoromethane	94		93		70-130

SEMIVOLATILES

Project Name: LEDGE RD LANDFILL
Lab Number: L2400193
Project Number: 289302
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400193-01
Client ID: WRA-5
Sample Location: ANDOVER, MA

Date Collected: 01/02/24 13:30
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8270E
Analytical Date: 01/04/24 12:01
Analyst: LJG
Percent Solids: 87%

Extraction Method: EPA 3546
Extraction Date: 01/04/24 00:22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP PAHs - Westborough Lab						
Acenaphthene	ND		ug/kg	150	--	1
Fluoranthene	ND		ug/kg	110	--	1
Naphthalene	ND		ug/kg	190	--	1
Benzo(a)anthracene	ND		ug/kg	110	--	1
Benzo(a)pyrene	ND		ug/kg	150	--	1
Benzo(b)fluoranthene	ND		ug/kg	110	--	1
Benzo(k)fluoranthene	ND		ug/kg	110	--	1
Chrysene	ND		ug/kg	110	--	1
Acenaphthylene	ND		ug/kg	150	--	1
Anthracene	ND		ug/kg	110	--	1
Benzo(ghi)perylene	ND		ug/kg	150	--	1
Fluorene	ND		ug/kg	190	--	1
Phenanthrene	ND		ug/kg	110	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	80	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	150	--	1
Pyrene	ND		ug/kg	110	--	1
2-Methylnaphthalene	ND		ug/kg	80	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	100		30-130
2-Fluorobiphenyl	80		30-130
4-Terphenyl-d14	70		30-130

Project Name: LEDGE RD LANDFILL
Lab Number: L2400193
Project Number: 289302
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400193-01
Client ID: WRA-5
Sample Location: ANDOVER, MA

Date Collected: 01/02/24 13:30
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8270E-SIM
Analytical Date: 01/11/24 12:10
Analyst: AMV
Percent Solids: 87%

Extraction Method: EPA 3570
Extraction Date: 01/09/24 23:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP 1,4 Dioxane by 8270E-SIM - Mansfield Lab						
1,4-Dioxane	ND		ug/kg	8.22	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,4-Dioxane-d8	51		15-110

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2400193
Report Date: 01/12/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E
Analytical Date: 01/04/24 10:03
Analyst: LJG

Extraction Method: EPA 3546
Extraction Date: 01/04/24 00:22

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01 Batch: WG1870800-1					
Acenaphthene	ND		ug/kg	130	--
Fluoranthene	ND		ug/kg	97	--
Naphthalene	ND		ug/kg	160	--
Benzo(a)anthracene	ND		ug/kg	97	--
Benzo(a)pyrene	ND		ug/kg	130	--
Benzo(b)fluoranthene	ND		ug/kg	97	--
Benzo(k)fluoranthene	ND		ug/kg	97	--
Chrysene	ND		ug/kg	97	--
Acenaphthylene	ND		ug/kg	130	--
Anthracene	ND		ug/kg	97	--
Benzo(ghi)perylene	ND		ug/kg	130	--
Fluorene	ND		ug/kg	160	--
Phenanthrene	ND		ug/kg	97	--
Dibenzo(a,h)anthracene	ND		ug/kg	68	--
Indeno(1,2,3-cd)pyrene	ND		ug/kg	130	--
Pyrene	ND		ug/kg	97	--
2-Methylnaphthalene	ND		ug/kg	68	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	98		30-130
2-Fluorobiphenyl	77		30-130
4-Terphenyl-d14	83		30-130

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2400193
Report Date: 01/12/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E-SIM
Analytical Date: 01/11/24 10:53
Analyst: AMV

Extraction Method: EPA 3570
Extraction Date: 01/09/24 23:00

Parameter	Result	Qualifier	Units	RL	MDL
MCP 1,4 Dioxane by 8270E-SIM - Mansfield Lab for sample(s): 01 Batch: WG1872485-1					
1,4-Dioxane	ND		ug/kg	8.00	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,4-Dioxane-d8	66		15-110

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2400193

Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01 Batch: WG1870800-2 WG1870800-3								
Acenaphthene	69		70		40-140	1		30
Fluoranthene	73		72		40-140	1		30
Naphthalene	75		73		40-140	3		30
Benzo(a)anthracene	79		76		40-140	4		30
Benzo(a)pyrene	80		75		40-140	6		30
Benzo(b)fluoranthene	79		69		40-140	14		30
Benzo(k)fluoranthene	72		77		40-140	7		30
Chrysene	80		75		40-140	6		30
Acenaphthylene	70		72		40-140	3		30
Anthracene	75		72		40-140	4		30
Benzo(ghi)perylene	74		72		40-140	3		30
Fluorene	70		71		40-140	1		30
Phenanthrene	74		71		40-140	4		30
Dibenzo(a,h)anthracene	79		75		40-140	5		30
Indeno(1,2,3-cd)pyrene	78		74		40-140	5		30
Pyrene	74		73		40-140	1		30
2-Methylnaphthalene	71		72		40-140	1		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2400193

Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01 Batch: WG1870800-2 WG1870800-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Nitrobenzene-d5	94		93		30-130
2-Fluorobiphenyl	72		70		30-130
4-Terphenyl-d14	78		74		30-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2400193

Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP 1,4 Dioxane by 8270E-SIM - Mansfield Lab Associated sample(s): 01 Batch: WG1872485-2 WG1872485-3								
1,4-Dioxane	118		118		40-140	0		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,4-Dioxane-d8	62		64		15-110

PETROLEUM HYDROCARBONS

Project Name: LEDGE RD LANDFILL
Lab Number: L2400193
Project Number: 289302
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400193-01
Client ID: WRA-5
Sample Location: ANDOVER, MA

Date Collected: 01/02/24 13:30
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 1,8015D(M)
Analytical Date: 01/04/24 07:07
Analyst: CRE
Percent Solids: 87%

Extraction Method: EPA 3546
Extraction Date: 01/03/24 23:42

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C10-C36)	ND		ug/kg	37000	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	86		40-140

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2400193
Report Date: 01/12/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015D(M)
Analytical Date: 01/04/24 09:03
Analyst: CRE

Extraction Method: EPA 3546
Extraction Date: 01/03/24 03:57

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbon Quantitation - Westborough Lab for sample(s): 01 Batch: WG1870358-1					
TPH (C10-C36)	ND		ug/kg	32700	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	67		40-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2400193

Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 01 Batch: WG1870358-2								
TPH (C10-C36)	72		-		40-140	-		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
o-Terphenyl	64				40-140

PCBS

Project Name: LEDGE RD LANDFILL
Lab Number: L2400193
Project Number: 289302
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400193-01
Client ID: WRA-5
Sample Location: ANDOVER, MA

Date Collected: 01/02/24 13:30
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8082A
Analytical Date: 01/04/24 07:29
Analyst: MHG
Percent Solids: 87%

Extraction Method: EPA 3546
Extraction Date: 01/03/24 18:37
Cleanup Method: EPA 3665A
Cleanup Date: 01/04/24
Cleanup Method: EPA 3660B
Cleanup Date: 01/04/24

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	55.9	--	1	A
Aroclor 1221	ND		ug/kg	55.9	--	1	A
Aroclor 1232	ND		ug/kg	55.9	--	1	A
Aroclor 1242	ND		ug/kg	55.9	--	1	A
Aroclor 1248	ND		ug/kg	55.9	--	1	A
Aroclor 1254	ND		ug/kg	55.9	--	1	A
Aroclor 1260	ND		ug/kg	55.9	--	1	A
Aroclor 1262	ND		ug/kg	55.9	--	1	A
Aroclor 1268	ND		ug/kg	55.9	--	1	A
PCBs, Total	ND		ug/kg	55.9	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	59		30-150	A
Decachlorobiphenyl	42		30-150	A
2,4,5,6-Tetrachloro-m-xylene	59		30-150	B
Decachlorobiphenyl	43		30-150	B

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2400193
Report Date: 01/12/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082A
Analytical Date: 01/04/24 07:09
Analyst: AKM

Extraction Method: EPA 3546
Extraction Date: 01/03/24 18:37
Cleanup Method: EPA 3665A
Cleanup Date: 01/04/24
Cleanup Method: EPA 3660B
Cleanup Date: 01/04/24

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01 Batch: WG1870751-1						
Aroclor 1016	ND		ug/kg	48.9	--	A
Aroclor 1221	ND		ug/kg	48.9	--	A
Aroclor 1232	ND		ug/kg	48.9	--	A
Aroclor 1242	ND		ug/kg	48.9	--	A
Aroclor 1248	ND		ug/kg	48.9	--	A
Aroclor 1254	ND		ug/kg	48.9	--	A
Aroclor 1260	ND		ug/kg	48.9	--	A
Aroclor 1262	ND		ug/kg	48.9	--	A
Aroclor 1268	ND		ug/kg	48.9	--	A
PCBs, Total	ND		ug/kg	48.9	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	63		30-150	A
Decachlorobiphenyl	44		30-150	A
2,4,5,6-Tetrachloro-m-xylene	63		30-150	B
Decachlorobiphenyl	48		30-150	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2400193
Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01 Batch: WG1870751-2 WG1870751-3									
Aroclor 1016	65		66		40-140	2		30	A
Aroclor 1260	53		55		40-140	4		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	60		62		30-150	A
Decachlorobiphenyl	43		45		30-150	A
2,4,5,6-Tetrachloro-m-xylene	59		61		30-150	B
Decachlorobiphenyl	46		46		30-150	B

METALS

Project Name: LEDGE RD LANDFILL
Lab Number: L2400193
Project Number: 289302
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400193-01
Client ID: WRA-5
Sample Location: ANDOVER, MA
Date Collected: 01/02/24 13:30
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 87%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.26	--	1	01/04/24 00:42	01/04/24 08:05	EPA 3050B	97,6010D	DMC
Arsenic, Total	11.6		mg/kg	0.452	--	1	01/04/24 00:42	01/04/24 08:05	EPA 3050B	97,6010D	DMC
Barium, Total	30.0		mg/kg	0.452	--	1	01/04/24 00:42	01/04/24 08:05	EPA 3050B	97,6010D	DMC
Beryllium, Total	0.427		mg/kg	0.226	--	1	01/04/24 00:42	01/04/24 08:05	EPA 3050B	97,6010D	DMC
Cadmium, Total	ND		mg/kg	0.452	--	1	01/04/24 00:42	01/04/24 08:05	EPA 3050B	97,6010D	DMC
Chromium, Total	21.0		mg/kg	0.452	--	1	01/04/24 00:42	01/04/24 08:05	EPA 3050B	97,6010D	DMC
Lead, Total	7.50		mg/kg	2.26	--	1	01/04/24 00:42	01/04/24 08:05	EPA 3050B	97,6010D	DMC
Mercury, Total	ND		mg/kg	0.085	--	1	01/04/24 01:06	01/04/24 08:57	EPA 7471B	97,7471B	GMG
Nickel, Total	18.0		mg/kg	1.13	--	1	01/04/24 00:42	01/04/24 08:05	EPA 3050B	97,6010D	DMC
Selenium, Total	ND		mg/kg	2.26	--	1	01/04/24 00:42	01/04/24 08:05	EPA 3050B	97,6010D	DMC
Silver, Total	ND		mg/kg	0.452	--	1	01/04/24 00:42	01/04/24 08:05	EPA 3050B	97,6010D	DMC
Thallium, Total	ND		mg/kg	2.26	--	1	01/04/24 00:42	01/04/24 08:05	EPA 3050B	97,6010D	DMC
Vanadium, Total	13.9		mg/kg	0.452	--	1	01/04/24 00:42	01/04/24 08:05	EPA 3050B	97,6010D	DMC
Zinc, Total	27.2		mg/kg	2.26	--	1	01/04/24 00:42	01/04/24 08:05	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400193

Project Number: 289302 **Report Date:** 01/12/24

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1870778-1										
Antimony, Total	ND		mg/kg	2.00	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Arsenic, Total	ND		mg/kg	0.400	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Barium, Total	ND		mg/kg	0.400	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Beryllium, Total	ND		mg/kg	0.200	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Cadmium, Total	ND		mg/kg	0.400	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Chromium, Total	ND		mg/kg	0.400	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Lead, Total	ND		mg/kg	2.00	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Nickel, Total	ND		mg/kg	1.00	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Selenium, Total	ND		mg/kg	2.00	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Silver, Total	ND		mg/kg	0.400	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Thallium, Total	ND		mg/kg	2.00	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Vanadium, Total	ND		mg/kg	0.400	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Zinc, Total	ND		mg/kg	2.00	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC

Prep Information

Digestion Method: EPA 3050B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1870779-1										
Mercury, Total	ND		mg/kg	0.083	--	1	01/04/24 01:06	01/04/24 08:47	97,7471B	GMG

Prep Information

Digestion Method: EPA 7471B

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2400193

Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1870778-2 WG1870778-3 SRM Lot Number: D122-540								
Antimony, Total	164		158		6-194	4		30
Arsenic, Total	109		104		81-119	5		30
Barium, Total	104		91		83-117	13		30
Beryllium, Total	104		101		83-117	3		30
Cadmium, Total	102		98		83-117	4		30
Chromium, Total	101		97		82-118	4		30
Lead, Total	105		101		83-117	4		30
Nickel, Total	105		101		83-117	4		30
Selenium, Total	117		113		81-119	3		30
Silver, Total	104		100		80-120	4		30
Thallium, Total	109		106		81-119	3		30
Vanadium, Total	96		92		80-120	4		30
Zinc, Total	102		99		82-119	3		30
MCP Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1870779-2 WG1870779-3 SRM Lot Number: D122-540								
Mercury, Total	102		96		73-127	6		30

INORGANICS
&
MISCELLANEOUS

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2400193
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400193-01
Client ID: WRA-5
Sample Location: ANDOVER, MA

Date Collected: 01/02/24 13:30
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	86.6		%	0.100	NA	1	-	01/04/24 07:38	121,2540G	ROI

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2400193
Report Date: 01/12/24

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2400193-01A	Vial MeOH preserved	A	NA		5.3	Y	Absent		MCP-8260HLW-21(14)
L2400193-01B	Vial water preserved	A	NA		5.3	Y	Absent	03-JAN-24 18:09	MCP-8260HLW-21(14)
L2400193-01C	Vial water preserved	A	NA		5.3	Y	Absent	03-JAN-24 18:09	MCP-8260HLW-21(14)
L2400193-01D	Plastic 120ml unpreserved	A	NA		5.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-TL-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-ZN-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L2400193-01E	Glass 60mL/2oz unpreserved	A	NA		5.3	Y	Absent		MCP-8082-10(365),TS(7),MCP-PAH-21(14),TPH-DRO-D(14)
L2400193-01F	Glass 250ml/8oz unpreserved	A	NA		5.3	Y	Absent		MCP-8082-10(365),A2-MCP-14DX-SIM-21(14),TS(7),MCP-PAH-21(14),TPH-DRO-D(14)

*Values in parentheses indicate holding time in days

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2400193
Project Number:	289302	**Report Date:**	01/12/24

GLOSSARY

Acronyms

DL - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EMPC - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LOD - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

LOQ - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

NR - No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TEF - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.

TEQ - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2400193
Project Number:	289302	**Report Date:**	01/12/24

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2400193
Project Number:	289302	**Report Date:**	01/12/24

Data Qualifiers

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: Data Usability Report

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

141 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA and IIB, November 2021.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 1/3/24

ALPHA Job #: L2400193

Client Information

Client: CDM Smith
Address: 75 State Street, Suite 701
Boston, MA 02109
Phone: 617-452-6563
Fax:
Email: JonesNE@cdmsmith.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Ledge Rd Landfill
Project Location: Andover, MA
Project #: 289302
Project Manager: Nathan Jones
ALPHA Quote #:

Turn-Around Time

☐ Standard ☒ RUSH (only confirmed if pre-approved)
Date Due: Time:

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program: MassDEP Criteria: RCS-1 Soil Standards

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

☒ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☒ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes ☒ N/A Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:
Detection limits for each parameter shall be less than reportable concentrations for RCS-1 criteria

ANALYSIS: VOCs - EPA 8260 | MCP-14 Metals - EPA 6010/7000 | PAHs - EPA 8270 | TPH - MassDEP Method | PCBs - EPA 8082

SAMPLE HANDLING
Filtration
☐ Done
☒ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	VOCs	MCP-14 Metals	PAHs	TPH	PCBs	Sample Specific Comments	TOTAL # BOTTLES
00193-	WRA-1-N			SO	JLW							
	WRA-1-S			SO	JLW							
	WRA-2			SO	JLW							
	WRA-3			SO	JLW							
	WRA-4			SO	JLW							
01	WRA-5	1/2/2024	13:30	SO	JLW	X	X	X	X	X		

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP or CT RCP?

Container Type
Preservative

Relinquished By:	Date/Time	Received By:	Date/Time
	1/3/24 1045		1/3/24 1045
	1/3/24 1526		1/3/24 1526

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

Method Blank Summary
Form 4
Volatiles

Client	: CDM Smith, Inc.	**Lab Number**	: L2400193
Project Name	: LEDGE RD LANDFILL	**Project Number**	: 289302
Lab Sample ID	: WG1871046-5	**Lab File ID**	: V29240104A05
Instrument ID	: VOA129		
Matrix	: SOIL	**Analysis Date**	: 01/04/24 09:41

Client Sample No.	Lab Sample ID	Analysis Date
WG1871046-3LCS	WG1871046-3	01/04/24 08:17
WG1871046-4LCSD	WG1871046-4	01/04/24 08:38
WRA-5	L2400193-01	01/04/24 11:04

Calibration Verification Summary
Form 7
Volatiles

Client	: CDM Smith, Inc.	**Lab Number**	: L2400193
Project Name	: LEDGE RD LANDFILL	**Project Number**	: 289302
Instrument ID	: VOA129	**Calibration Date**	: 01/04/24 08:17
Lab File ID	: V29240104A01	**Init. Calib. Date(s)**	: 12/19/23 12/20/23
Sample No	: WG1871046-2	**Init. Calib. Times**	: 21:48 01:16
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
Fluorobenzene	1	1	-	0	20	87	0
Dichlorodifluoromethane	0.332	0.167	-	49.7*	20	41	0
Chloromethane	0.42	0.377	-	10.2	20	74	0
Vinyl chloride	0.377	0.317	-	15.9	20	69	0
Bromomethane	0.185	0.153	-	17.3	20	76	0
Chloroethane	0.206	0.195	-	5.3	20	78	0
Trichlorofluoromethane	0.367	0.311	-	15.3	20	69	0
Ethyl ether	0.13	0.115	-	11.5	20	75	0
1,1-Dichloroethene	0.225	0.184	-	18.2	20	68	0
Carbon disulfide	0.786	0.63	-	19.8	20	66	0
Freon-113	0.237	0.201	-	15.2	20	67	0
Acrolein	40	35.033	-	12.4	20	78	0
Methylene chloride	40	34.114	-	14.7	20	71	0
Acetone	40	33.042	-	17.4	20	76	0
trans-1,2-Dichloroethene	0.255	0.218	-	14.5	20	71	0
Methyl acetate	0.254	0.217	-	14.6	20	80	0
Methyl tert-butyl ether	0.671	0.598	-	10.9	20	72	-.01
tert-Butyl alcohol	0.045	0.03	-	33.3*	20	63	-.02
Diisopropyl ether	1.023	1.43	-	-39.8*	20	112	-.01
1,1-Dichloroethane	0.563	0.579	-	-2.8	20	86	0
Halothane	0.193	0.161	-	16.6	20	69	0
Acrylonitrile	0.108	0.11	-	-1.9	20	91	0
Ethyl tert-butyl ether	0.907	0.869	-	4.2	20	76	-.01
Vinyl acetate	0.658	0.633	-	3.8	20	79	0
cis-1,2-Dichloroethene	0.289	0.236	-	18.3	20	67	0
2,2-Dichloropropane	0.35	0.265	-	24.3*	20	63	0
Bromochloromethane	0.134	0.106	-	20.9*	20	67	0
Cyclohexane	0.555	0.539	-	2.9	20	76	0
Chloroform	0.485	0.424	-	12.6	20	72	0
Ethyl acetate	0.302	0.274	-	9.3	20	76	0
Carbon tetrachloride	0.313	0.271	-	13.4	20	69	0
Tetrahydrofuran	0.112	0.093	-	17	20	74	0
Dibromofluoromethane	0.252	0.238	-	5.6	20	82	0
1,1,1-Trichloroethane	0.381	0.336	-	11.8	20	68	0
2-Butanone	0.151	0.124	-	17.9	20	73	0
1,1-Dichloropropene	0.343	0.323	-	5.8	20	73	0
Benzene	0.99	0.901	-	9	20	72	0
tert-Amyl methyl ether	0.633	0.515	-	18.6	20	65	0
1,2-Dichloroethane-d4	0.321	0.333	-	-3.7	20	92	0
1,2-Dichloroethane	0.417	0.389	-	6.7	20	77	0
Methyl cyclohexane	0.428	0.371	-	13.3	20	67	0
Trichloroethene	0.26	0.242	-	6.9	20	72	0
Dibromomethane	0.162	0.134	-	17.3	20	69	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: CDM Smith, Inc.	**Lab Number**	: L2400193
Project Name	: LEDGE RD LANDFILL	**Project Number**	: 289302
Instrument ID	: VOA129	**Calibration Date**	: 01/04/24 08:17
Lab File ID	: V29240104A01	**Init. Calib. Date(s)**	: 12/19/23 12/20/23
Sample No	: WG1871046-2	**Init. Calib. Times**	: 21:48 01:16
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
1,2-Dichloropropane	0.306	0.296	-	3.3	20	77	0
2-Chloroethyl vinyl ether	0.184	0.16	-	13	20	71	-.03
Bromodichloromethane	0.336	0.309	-	8	20	73	0
1,4-Dioxane	0.00323	0.00243*	-	24.8*	20	65	0
cis-1,3-Dichloropropene	0.366	0.326	-	10.9	20	68	0
Chlorobenzene-d5	1	1	-	0	20	88	0
Toluene-d8	1.302	1.256	-	3.5	20	85	0
Toluene	0.875	0.753	-	13.9	20	71	0
4-Methyl-2-pentanone	0.155	0.133	-	14.2	20	70	0
Tetrachloroethene	0.338	0.288	-	14.8	20	67	0
trans-1,3-Dichloropropene	0.445	0.37	-	16.9	20	67	0
Ethyl methacrylate	0.351	0.304	-	13.4	20	70	0
1,1,2-Trichloroethane	0.248	0.223	-	10.1	20	74	0
Chlorodibromomethane	0.307	0.269	-	12.4	20	69	0
1,3-Dichloropropane	0.508	0.457	-	10	20	73	0
1,2-Dibromoethane	0.274	0.241	-	12	20	70	0
2-Hexanone	0.275	0.25	-	9.1	20	75	0
Chlorobenzene	0.945	0.826	-	12.6	20	71	0
Ethylbenzene	1.663	1.502	-	9.7	20	74	0
1,1,1,2-Tetrachloroethane	40	31.36	-	21.6*	20	69	0
p/m Xylene	0.625	0.561	-	10.2	20	72	0
o Xylene	0.606	0.539	-	11.1	20	72	0
Styrene	0.997	0.919	-	7.8	20	72	0
1,4-Dichlorobenzene-d4	1	1	-	0	20	90	0
Bromoform	0.388	0.303	-	21.9*	20	65	0
Isopropylbenzene	3.156	2.888	-	8.5	20	73	0
4-Bromofluorobenzene	0.963	0.931	-	3.3	20	86	0
Bromobenzene	0.786	0.658	-	16.3	20	69	0
n-Propylbenzene	3.818	3.593	-	5.9	20	76	0
1,4-Dichlorobutane	1.245	1.214	-	2.5	20	81	0
1,1,2,2-Tetrachloroethane	0.713	0.629	-	11.8	20	70	0
4-Ethyltoluene	3.149	2.953	-	6.2	20	75	0
2-Chlorotoluene	2.37	2.474	-	-4.4	20	86	0
1,3,5-Trimethylbenzene	2.79	2.526	-	9.5	20	73	0
1,2,3-Trichloropropane	0.642	0.552	-	14	20	72	0
trans-1,4-Dichloro-2-buten	0.263	0.251	-	4.6	20	83	0
4-Chlorotoluene	2.434	2.235	-	8.2	20	75	0
tert-Butylbenzene	2.31	2.086	-	9.7	20	74	0
1,2,4-Trimethylbenzene	2.69	2.479	-	7.8	20	74	0
sec-Butylbenzene	3.438	3.194	-	7.1	20	74	0
p-Isopropyltoluene	2.933	2.728	-	7	20	75	0
1,3-Dichlorobenzene	1.526	1.324	-	13.2	20	71	0
1,4-Dichlorobenzene	1.552	1.32	-	14.9	20	71	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: CDM Smith, Inc.		**Lab Number**	: L2400193	
Project Name	: LEDGE RD LANDFILL		**Project Number**	: 289302	
Instrument ID	: VOA129		**Calibration Date**	: 01/04/24 08:17	
Lab File ID	: V29240104A01		**Init. Calib. Date(s)**	: 12/19/23	12/20/23
Sample No	: WG1871046-2		**Init. Calib. Times**	: 21:48	01:16
Channel	:				

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
p-Diethylbenzene	1.805	1.669	-	7.5	20	74	0
n-Butylbenzene	2.679	2.646	-	1.2	20	79	0
1,2-Dichlorobenzene	1.438	1.231	-	14.4	20	72	0
1,2,4,5-Tetramethylbenzene	2.739	2.57	-	6.2	20	75	0
1,2-Dibromo-3-chloropropan	0.115	0.085	-	26.1*	20	64	0
1,3,5-Trichlorobenzene	1.142	1.015	-	11.1	20	75	0
Hexachlorobutadiene	0.554	0.447	-	19.3	20	66	0
1,2,4-Trichlorobenzene	1.012	0.918	-	9.3	20	75	0
Naphthalene	2.453	2.018	-	17.7	20	68	0
1,2,3-Trichlorobenzene	0.973	0.829	-	14.8	20	72	0

* Value outside of QC limits.

ANALYTICAL REPORT

Lab Number:	L2400301
Client:	CDM Smith, Inc. 75 State Street Suite 701 Boston, MA 02109
ATTN:	Nathan Jones
Phone:	(617) 452-6563
Project Name:	LEDGE RD LANDFILL
Project Number:	289302
Report Date:	01/12/24

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Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2400301
Report Date: 01/12/24

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2400301-01	WRA-3	SOIL	ANDOVER, MA	01/03/24 11:00	01/03/24
L2400301-02	WRA-4	SOIL	ANDOVER, MA	01/03/24 11:50	01/03/24
L2400301-03	TRIP BLANK	SOIL	ANDOVER, MA	01/03/24 00:00	01/03/24

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400301

Project Number: 289302 **Report Date:** 01/12/24

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	NO

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2400301
Project Number:	289302	**Report Date:**	01/12/24

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2400301
Project Number:	289302	**Report Date:**	01/12/24

Case Narrative (continued)

Report Submission

January 12, 2024: This final report includes the results of all requested analyses.

January 05, 2024: This is a preliminary report.

MCP Related Narratives

Sample Receipt

L2400301-03: A sample identified as "TRIP BLANK" was received, but not listed on the Chain of Custody. This sample was not analyzed.

In reference to question H:

A Matrix Spike was not submitted for the analysis of Total Metals.

Volatile Organics

L2400301-01 and -02: Initial calibration utilized a quadratic fit for: 1,1,1,2-tetrachloroethane

In reference to question H:

L2400301-01 and -02: Initial Calibration did not meet:

Lowest Calibration Standard Minimum Response Factor: trichloroethene (0.1904), bromodichloromethane (0.2472), 1,4-dioxane (0.0032), cis-1,3-dichloropropene (0.2490)

Average Response Factor: 1,4-dioxane

Verification: dichlorodifluoromethane (62%)

L2400301-01 and -02: The associated continuing calibration standard is outside the acceptance criteria for several compounds; however, it is within overall method allowances. Associated results are considered to be biased high if the %D is negative and biased low if the %D is positive. A copy of the continuing calibration standard is included as an addendum to this report.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2400301
Project Number:	289302	**Report Date:**	01/12/24

Case Narrative (continued)

PAHs

In reference to question I:

All samples were analyzed for a subset of MCP analytes per client request.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Cristin Walker

Title: Technical Director/Representative Date: 01/12/24

QC OUTLIER SUMMARY REPORT

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2400301
Report Date: 01/12/24

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment
MCP Volatile Organics by EPA 5035 Low - Westborough Lab								
8260D	Batch QC	WG1871046-3	Dichlorodifluoromethane	LCS	50	70-130	01-02	potential low bias
8260D	Batch QC	WG1871046-3	Diisopropyl Ether	LCS	140	70-130	01-02	potential high bias
8260D	Batch QC	WG1871046-4	Dichlorodifluoromethane	LCSD	48	70-130	01-02	potential low bias
8260D	Batch QC	WG1871046-4	Acetone	LCSD	29	20	01-02	non-directional bias

ORGANICS

VOLATILES

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400301

Project Number: 289302 **Report Date:** 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-01 Date Collected: 01/03/24 11:00
Client ID: WRA-3 Date Received: 01/03/24
Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8260D
Analytical Date: 01/04/24 11:25
Analyst: AJK
Percent Solids: 85%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Methylene chloride	ND		ug/kg	9.5	--	1
1,1-Dichloroethane	ND		ug/kg	1.9	--	1
Chloroform	ND		ug/kg	2.8	--	1
Carbon tetrachloride	ND		ug/kg	1.9	--	1
1,2-Dichloropropane	ND		ug/kg	1.9	--	1
Dibromochloromethane	ND		ug/kg	1.9	--	1
1,1,2-Trichloroethane	ND		ug/kg	1.9	--	1
Tetrachloroethene	ND		ug/kg	0.95	--	1
Chlorobenzene	ND		ug/kg	0.95	--	1
Trichlorofluoromethane	ND		ug/kg	7.6	--	1
1,2-Dichloroethane	ND		ug/kg	1.9	--	1
1,1,1-Trichloroethane	ND		ug/kg	0.95	--	1
Bromodichloromethane	ND		ug/kg	0.95	--	1
trans-1,3-Dichloropropene	ND		ug/kg	1.9	--	1
cis-1,3-Dichloropropene	ND		ug/kg	0.95	--	1
1,3-Dichloropropene, Total	ND		ug/kg	0.95	--	1
1,1-Dichloropropene	ND		ug/kg	0.95	--	1
Bromoform	ND		ug/kg	7.6	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.95	--	1
Benzene	ND		ug/kg	0.95	--	1
Toluene	ND		ug/kg	1.9	--	1
Ethylbenzene	ND		ug/kg	1.9	--	1
Chloromethane	ND		ug/kg	7.6	--	1
Bromomethane	ND		ug/kg	3.8	--	1
Vinyl chloride	ND		ug/kg	1.9	--	1
Chloroethane	ND		ug/kg	3.8	--	1
1,1-Dichloroethene	ND		ug/kg	1.9	--	1
trans-1,2-Dichloroethene	ND		ug/kg	2.8	--	1

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400301

Project Number: 289302 **Report Date:** 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-01 Date Collected: 01/03/24 11:00

Client ID: WRA-3 Date Received: 01/03/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Trichloroethene	ND		ug/kg	0.95	--	1
1,2-Dichlorobenzene	ND		ug/kg	3.8	--	1
1,3-Dichlorobenzene	ND		ug/kg	3.8	--	1
1,4-Dichlorobenzene	ND		ug/kg	3.8	--	1
Methyl tert butyl ether	ND		ug/kg	3.8	--	1
p/m-Xylene	ND		ug/kg	3.8	--	1
o-Xylene	ND		ug/kg	1.9	--	1
Xylenes, Total	ND		ug/kg	1.9	--	1
cis-1,2-Dichloroethene	ND		ug/kg	1.9	--	1
1,2-Dichloroethene, Total	ND		ug/kg	1.9	--	1
Dibromomethane	ND		ug/kg	3.8	--	1
1,2,3-Trichloropropane	ND		ug/kg	3.8	--	1
Styrene	ND		ug/kg	1.9	--	1
Dichlorodifluoromethane	ND		ug/kg	19	--	1
Acetone	ND		ug/kg	47	--	1
Carbon disulfide	ND		ug/kg	19	--	1
Methyl ethyl ketone	ND		ug/kg	19	--	1
Methyl isobutyl ketone	ND		ug/kg	19	--	1
2-Hexanone	ND		ug/kg	19	--	1
Bromochloromethane	ND		ug/kg	3.8	--	1
Tetrahydrofuran	ND		ug/kg	7.6	--	1
2,2-Dichloropropane	ND		ug/kg	3.8	--	1
1,2-Dibromoethane	ND		ug/kg	1.9	--	1
1,3-Dichloropropane	ND		ug/kg	3.8	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	0.95	--	1
Bromobenzene	ND		ug/kg	3.8	--	1
n-Butylbenzene	ND		ug/kg	1.9	--	1
sec-Butylbenzene	ND		ug/kg	1.9	--	1
tert-Butylbenzene	ND		ug/kg	3.8	--	1
o-Chlorotoluene	ND		ug/kg	3.8	--	1
p-Chlorotoluene	ND		ug/kg	3.8	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	5.7	--	1
Hexachlorobutadiene	ND		ug/kg	7.6	--	1
Isopropylbenzene	ND		ug/kg	1.9	--	1
p-Isopropyltoluene	ND		ug/kg	1.9	--	1
Naphthalene	ND		ug/kg	7.6	--	1
n-Propylbenzene	ND		ug/kg	1.9	--	1

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400301

Project Number: 289302 **Report Date:** 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-01 Date Collected: 01/03/24 11:00

Client ID: WRA-3 Date Received: 01/03/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	3.8	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	3.8	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	3.8	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	3.8	--	1
Diethyl ether	ND		ug/kg	3.8	--	1
Diisopropyl Ether	ND		ug/kg	3.8	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	3.8	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	3.8	--	1
1,4-Dioxane	ND		ug/kg	150	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	116		70-130
Toluene-d8	93		70-130
4-Bromofluorobenzene	98		70-130
Dibromofluoromethane	103		70-130

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400301

Project Number: 289302 **Report Date:** 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-02 Date Collected: 01/03/24 11:50
Client ID: WRA-4 Date Received: 01/03/24
Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8260D
Analytical Date: 01/04/24 11:46
Analyst: AJK
Percent Solids: 73%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Methylene chloride	ND		ug/kg	18	--	1
1,1-Dichloroethane	ND		ug/kg	3.7	--	1
Chloroform	ND		ug/kg	5.5	--	1
Carbon tetrachloride	ND		ug/kg	3.7	--	1
1,2-Dichloropropane	ND		ug/kg	3.7	--	1
Dibromochloromethane	ND		ug/kg	3.7	--	1
1,1,2-Trichloroethane	ND		ug/kg	3.7	--	1
Tetrachloroethene	ND		ug/kg	1.8	--	1
Chlorobenzene	190		ug/kg	1.8	--	1
Trichlorofluoromethane	ND		ug/kg	15	--	1
1,2-Dichloroethane	ND		ug/kg	3.7	--	1
1,1,1-Trichloroethane	ND		ug/kg	1.8	--	1
Bromodichloromethane	ND		ug/kg	1.8	--	1
trans-1,3-Dichloropropene	ND		ug/kg	3.7	--	1
cis-1,3-Dichloropropene	ND		ug/kg	1.8	--	1
1,3-Dichloropropene, Total	ND		ug/kg	1.8	--	1
1,1-Dichloropropene	ND		ug/kg	1.8	--	1
Bromoform	ND		ug/kg	15	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.8	--	1
Benzene	4.4		ug/kg	1.8	--	1
Toluene	ND		ug/kg	3.7	--	1
Ethylbenzene	ND		ug/kg	3.7	--	1
Chloromethane	ND		ug/kg	15	--	1
Bromomethane	ND		ug/kg	7.4	--	1
Vinyl chloride	ND		ug/kg	3.7	--	1
Chloroethane	ND		ug/kg	7.4	--	1
1,1-Dichloroethene	ND		ug/kg	3.7	--	1
trans-1,2-Dichloroethene	ND		ug/kg	5.5	--	1

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400301

Project Number: 289302 **Report Date:** 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-02 Date Collected: 01/03/24 11:50

Client ID: WRA-4 Date Received: 01/03/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Trichloroethene	ND		ug/kg	1.8	--	1
1,2-Dichlorobenzene	19		ug/kg	7.4	--	1
1,3-Dichlorobenzene	ND		ug/kg	7.4	--	1
1,4-Dichlorobenzene	40		ug/kg	7.4	--	1
Methyl tert butyl ether	ND		ug/kg	7.4	--	1
p/m-Xylene	11		ug/kg	7.4	--	1
o-Xylene	ND		ug/kg	3.7	--	1
Xylenes, Total	11		ug/kg	3.7	--	1
cis-1,2-Dichloroethene	ND		ug/kg	3.7	--	1
1,2-Dichloroethene, Total	ND		ug/kg	3.7	--	1
Dibromomethane	ND		ug/kg	7.4	--	1
1,2,3-Trichloropropane	ND		ug/kg	7.4	--	1
Styrene	ND		ug/kg	3.7	--	1
Dichlorodifluoromethane	ND		ug/kg	37	--	1
Acetone	ND		ug/kg	92	--	1
Carbon disulfide	ND		ug/kg	37	--	1
Methyl ethyl ketone	ND		ug/kg	37	--	1
Methyl isobutyl ketone	ND		ug/kg	37	--	1
2-Hexanone	ND		ug/kg	37	--	1
Bromochloromethane	ND		ug/kg	7.4	--	1
Tetrahydrofuran	ND		ug/kg	15	--	1
2,2-Dichloropropane	ND		ug/kg	7.4	--	1
1,2-Dibromoethane	ND		ug/kg	3.7	--	1
1,3-Dichloropropane	ND		ug/kg	7.4	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.8	--	1
Bromobenzene	ND		ug/kg	7.4	--	1
n-Butylbenzene	ND		ug/kg	3.7	--	1
sec-Butylbenzene	ND		ug/kg	3.7	--	1
tert-Butylbenzene	ND		ug/kg	7.4	--	1
o-Chlorotoluene	ND		ug/kg	7.4	--	1
p-Chlorotoluene	ND		ug/kg	7.4	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	11	--	1
Hexachlorobutadiene	ND		ug/kg	15	--	1
Isopropylbenzene	11		ug/kg	3.7	--	1
p-Isopropyltoluene	ND		ug/kg	3.7	--	1
Naphthalene	ND		ug/kg	15	--	1
n-Propylbenzene	ND		ug/kg	3.7	--	1

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400301

Project Number: 289302 **Report Date:** 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-02 Date Collected: 01/03/24 11:50

Client ID: WRA-4 Date Received: 01/03/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	7.4	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	7.4	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	7.4	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	7.4	--	1
Diethyl ether	ND		ug/kg	7.4	--	1
Diisopropyl Ether	ND		ug/kg	7.4	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	7.4	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	7.4	--	1
1,4-Dioxane	ND		ug/kg	290	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	112		70-130
Toluene-d8	96		70-130
4-Bromofluorobenzene	98		70-130
Dibromofluoromethane	98		70-130

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400301

Project Number: 289302 **Report Date:** 01/12/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 01/04/24 09:41
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01-02 Batch: WG1871046-5					
Methylene chloride	ND		ug/kg	5.0	--
1,1-Dichloroethane	ND		ug/kg	1.0	--
Chloroform	ND		ug/kg	1.5	--
Carbon tetrachloride	ND		ug/kg	1.0	--
1,2-Dichloropropane	ND		ug/kg	1.0	--
Dibromochloromethane	ND		ug/kg	1.0	--
1,1,2-Trichloroethane	ND		ug/kg	1.0	--
Tetrachloroethene	ND		ug/kg	0.50	--
Chlorobenzene	ND		ug/kg	0.50	--
Trichlorofluoromethane	ND		ug/kg	4.0	--
1,2-Dichloroethane	ND		ug/kg	1.0	--
1,1,1-Trichloroethane	ND		ug/kg	0.50	--
Bromodichloromethane	ND		ug/kg	0.50	--
trans-1,3-Dichloropropene	ND		ug/kg	1.0	--
cis-1,3-Dichloropropene	ND		ug/kg	0.50	--
1,3-Dichloropropene, Total	ND		ug/kg	0.50	--
1,1-Dichloropropene	ND		ug/kg	0.50	--
Bromoform	ND		ug/kg	4.0	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.50	--
Benzene	ND		ug/kg	0.50	--
Toluene	ND		ug/kg	1.0	--
Ethylbenzene	ND		ug/kg	1.0	--
Chloromethane	ND		ug/kg	4.0	--
Bromomethane	ND		ug/kg	2.0	--
Vinyl chloride	ND		ug/kg	1.0	--
Chloroethane	ND		ug/kg	2.0	--
1,1-Dichloroethene	ND		ug/kg	1.0	--
trans-1,2-Dichloroethene	ND		ug/kg	1.5	--
Trichloroethene	ND		ug/kg	0.50	--

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400301

Project Number: 289302 **Report Date:** 01/12/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 01/04/24 09:41
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01-02 Batch: WG1871046-5					
1,2-Dichlorobenzene	ND		ug/kg	2.0	--
1,3-Dichlorobenzene	ND		ug/kg	2.0	--
1,4-Dichlorobenzene	ND		ug/kg	2.0	--
Methyl tert butyl ether	ND		ug/kg	2.0	--
p/m-Xylene	ND		ug/kg	2.0	--
o-Xylene	ND		ug/kg	1.0	--
Xylenes, Total	ND		ug/kg	1.0	--
cis-1,2-Dichloroethene	ND		ug/kg	1.0	--
1,2-Dichloroethene, Total	ND		ug/kg	1.0	--
Dibromomethane	ND		ug/kg	2.0	--
1,2,3-Trichloropropane	ND		ug/kg	2.0	--
Styrene	ND		ug/kg	1.0	--
Dichlorodifluoromethane	ND		ug/kg	10	--
Acetone	ND		ug/kg	25	--
Carbon disulfide	ND		ug/kg	10	--
Methyl ethyl ketone	ND		ug/kg	10	--
Methyl isobutyl ketone	ND		ug/kg	10	--
2-Hexanone	ND		ug/kg	10	--
Bromochloromethane	ND		ug/kg	2.0	--
Tetrahydrofuran	ND		ug/kg	4.0	--
2,2-Dichloropropane	ND		ug/kg	2.0	--
1,2-Dibromoethane	ND		ug/kg	1.0	--
1,3-Dichloropropane	ND		ug/kg	2.0	--
1,1,1,2-Tetrachloroethane	ND		ug/kg	0.50	--
Bromobenzene	ND		ug/kg	2.0	--
n-Butylbenzene	ND		ug/kg	1.0	--
sec-Butylbenzene	ND		ug/kg	1.0	--
tert-Butylbenzene	ND		ug/kg	2.0	--
o-Chlorotoluene	ND		ug/kg	2.0	--

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400301

Project Number: 289302 **Report Date:** 01/12/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 01/04/24 09:41
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01-02 Batch: WG1871046-5					
p-Chlorotoluene	ND		ug/kg	2.0	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	3.0	--
Hexachlorobutadiene	ND		ug/kg	4.0	--
Isopropylbenzene	ND		ug/kg	1.0	--
p-Isopropyltoluene	ND		ug/kg	1.0	--
Naphthalene	ND		ug/kg	4.0	--
n-Propylbenzene	ND		ug/kg	1.0	--
1,2,3-Trichlorobenzene	ND		ug/kg	2.0	--
1,2,4-Trichlorobenzene	ND		ug/kg	2.0	--
1,3,5-Trimethylbenzene	ND		ug/kg	2.0	--
1,2,4-Trimethylbenzene	ND		ug/kg	2.0	--
Diethyl ether	ND		ug/kg	2.0	--
Diisopropyl Ether	ND		ug/kg	2.0	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	2.0	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	2.0	--
1,4-Dioxane	ND		ug/kg	80	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	112		70-130
Toluene-d8	94		70-130
4-Bromofluorobenzene	96		70-130
Dibromofluoromethane	97		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2400301

Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01-02 Batch: WG1871046-3 WG1871046-4								
Methylene chloride	85		93		70-130	9		20
1,1-Dichloroethane	103		92		70-130	11		20
Chloroform	87		89		70-130	2		20
Carbon tetrachloride	87		88		70-130	1		20
1,2-Dichloropropane	97		98		70-130	1		20
Dibromochloromethane	88		97		70-130	10		20
1,1,2-Trichloroethane	90		96		70-130	6		20
Tetrachloroethene	85		86		70-130	1		20
Chlorobenzene	87		90		70-130	3		20
Trichlorofluoromethane	85		82		70-130	4		20
1,2-Dichloroethane	93		97		70-130	4		20
1,1,1-Trichloroethane	88		89		70-130	1		20
Bromodichloromethane	92		96		70-130	4		20
trans-1,3-Dichloropropene	83		91		70-130	9		20
cis-1,3-Dichloropropene	89		94		70-130	5		20
1,1-Dichloropropene	94		92		70-130	2		20
Bromoform	78		92		70-130	16		20
1,1,2,2-Tetrachloroethane	88		101		70-130	14		20
Benzene	91		90		70-130	1		20
Toluene	86		88		70-130	2		20
Ethylbenzene	90		93		70-130	3		20
Chloromethane	90		87		70-130	3		20
Bromomethane	83		79		70-130	5		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2400301

Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab	Associated sample(s): 01-02		Batch: WG1871046-3 WG1871046-4					
Vinyl chloride	84		82		70-130	2		20
Chloroethane	95		92		70-130	3		20
1,1-Dichloroethene	82		82		70-130	0		20
trans-1,2-Dichloroethene	86		89		70-130	3		20
Trichloroethene	93		93		70-130	0		20
1,2-Dichlorobenzene	86		93		70-130	8		20
1,3-Dichlorobenzene	87		90		70-130	3		20
1,4-Dichlorobenzene	85		89		70-130	5		20
Methyl tert butyl ether	89		99		70-130	11		20
p/m-Xylene	90		92		70-130	2		20
o-Xylene	89		92		70-130	3		20
cis-1,2-Dichloroethene	82		83		70-130	1		20
Dibromomethane	83		88		70-130	6		20
1,2,3-Trichloropropane	86		96		70-130	11		20
Styrene	92		95		70-130	3		20
Dichlorodifluoromethane	**50**	Q	**48**	Q	70-130	4		20
Acetone	83		111		70-130	**29**	Q	20
Carbon disulfide	80		81		70-130	1		20
Methyl ethyl ketone	82		96		70-130	16		20
Methyl isobutyl ketone	86		101		70-130	16		20
2-Hexanone	91		111		70-130	20		20
Bromochloromethane	79		81		70-130	3		20
Tetrahydrofuran	83		96		70-130	15		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2400301
Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01-02 Batch: WG1871046-3 WG1871046-4								
2,2-Dichloropropane	76		77		70-130	1		20
1,2-Dibromoethane	88		96		70-130	9		20
1,3-Dichloropropane	90		97		70-130	7		20
1,1,1,2-Tetrachloroethane	78		85		70-130	9		20
Bromobenzene	84		88		70-130	5		20
n-Butylbenzene	99		100		70-130	1		20
sec-Butylbenzene	93		96		70-130	3		20
tert-Butylbenzene	90		93		70-130	3		20
o-Chlorotoluene	104		106		70-130	2		20
p-Chlorotoluene	92		94		70-130	2		20
1,2-Dibromo-3-chloropropane	74		90		70-130	20		20
Hexachlorobutadiene	81		82		70-130	1		20
Isopropylbenzene	92		94		70-130	2		20
p-Isopropyltoluene	93		94		70-130	1		20
Naphthalene	82		94		70-130	14		20
n-Propylbenzene	94		97		70-130	3		20
1,2,3-Trichlorobenzene	85		92		70-130	8		20
1,2,4-Trichlorobenzene	91		95		70-130	4		20
1,3,5-Trimethylbenzene	91		94		70-130	3		20
1,2,4-Trimethylbenzene	92		95		70-130	3		20
Diethyl ether	88		93		70-130	6		20
Diisopropyl Ether	**140**	Q	115		70-130	20		20
Ethyl-Tert-Butyl-Ether	96		99		70-130	3		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2400301
Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab	Associated sample(s): 01-02		Batch: WG1871046-3 WG1871046-4					
Tertiary-Amyl Methyl Ether	81		87		70-130	7		20
1,4-Dioxane	75		87		70-130	15		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	104		104		70-130
Toluene-d8	96		97		70-130
4-Bromofluorobenzene	97		97		70-130
Dibromofluoromethane	94		93		70-130

SEMIVOLATILES

Project Name: LEDGE RD LANDFILL
Lab Number: L2400301
Project Number: 289302
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-01
Client ID: WRA-3
Sample Location: ANDOVER, MA

Date Collected: 01/03/24 11:00
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8270E
Analytical Date: 01/04/24 12:24
Analyst: LJG
Percent Solids: 85%

Extraction Method: EPA 3546
Extraction Date: 01/04/24 00:25

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP PAHs - Westborough Lab						
Acenaphthene	ND		ug/kg	150	--	1
Fluoranthene	ND		ug/kg	120	--	1
Naphthalene	ND		ug/kg	190	--	1
Benzo(a)anthracene	ND		ug/kg	120	--	1
Benzo(a)pyrene	ND		ug/kg	150	--	1
Benzo(b)fluoranthene	ND		ug/kg	120	--	1
Benzo(k)fluoranthene	ND		ug/kg	120	--	1
Chrysene	ND		ug/kg	120	--	1
Acenaphthylene	ND		ug/kg	150	--	1
Anthracene	ND		ug/kg	120	--	1
Benzo(ghi)perylene	ND		ug/kg	150	--	1
Fluorene	ND		ug/kg	190	--	1
Phenanthrene	ND		ug/kg	120	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	81	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	150	--	1
Pyrene	ND		ug/kg	120	--	1
2-Methylnaphthalene	ND		ug/kg	81	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	105		30-130
2-Fluorobiphenyl	74		30-130
4-Terphenyl-d14	70		30-130

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2400301
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-02
Client ID: WRA-4
Sample Location: ANDOVER, MA

Date Collected: 01/03/24 11:50
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8270E
Analytical Date: 01/04/24 12:48
Analyst: LJG
Percent Solids: 73%

Extraction Method: EPA 3546
Extraction Date: 01/04/24 00:22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP PAHs - Westborough Lab						
Acenaphthene	ND		ug/kg	180	--	1
Fluoranthene	510		ug/kg	130	--	1
Naphthalene	ND		ug/kg	220	--	1
Benzo(a)anthracene	340		ug/kg	130	--	1
Benzo(a)pyrene	340		ug/kg	180	--	1
Benzo(b)fluoranthene	360		ug/kg	130	--	1
Benzo(k)fluoranthene	130		ug/kg	130	--	1
Chrysene	420		ug/kg	130	--	1
Acenaphthylene	180		ug/kg	180	--	1
Anthracene	ND		ug/kg	130	--	1
Benzo(ghi)perylene	200		ug/kg	180	--	1
Fluorene	ND		ug/kg	220	--	1
Phenanthrene	260		ug/kg	130	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	94	--	1
Indeno(1,2,3-cd)pyrene	210		ug/kg	180	--	1
Pyrene	640		ug/kg	130	--	1
2-Methylnaphthalene	ND		ug/kg	94	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	101		30-130
2-Fluorobiphenyl	67		30-130
4-Terphenyl-d14	50		30-130

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2400301
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-02
Client ID: WRA-4
Sample Location: ANDOVER, MA

Date Collected: 01/03/24 11:50
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8270E-SIM
Analytical Date: 01/11/24 12:36
Analyst: AMV
Percent Solids: 73%

Extraction Method: EPA 3570
Extraction Date: 01/09/24 23:00

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP 1,4 Dioxane by 8270E-SIM - Mansfield Lab						
1,4-Dioxane	ND		ug/kg	10.4	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,4-Dioxane-d8	55		15-110

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2400301
Report Date: 01/12/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E
Analytical Date: 01/04/24 10:03
Analyst: LJG

Extraction Method: EPA 3546
Extraction Date: 01/04/24 00:22

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-02 Batch: WG1870800-1					
Acenaphthene	ND		ug/kg	130	--
Fluoranthene	ND		ug/kg	97	--
Naphthalene	ND		ug/kg	160	--
Benzo(a)anthracene	ND		ug/kg	97	--
Benzo(a)pyrene	ND		ug/kg	130	--
Benzo(b)fluoranthene	ND		ug/kg	97	--
Benzo(k)fluoranthene	ND		ug/kg	97	--
Chrysene	ND		ug/kg	97	--
Acenaphthylene	ND		ug/kg	130	--
Anthracene	ND		ug/kg	97	--
Benzo(ghi)perylene	ND		ug/kg	130	--
Fluorene	ND		ug/kg	160	--
Phenanthrene	ND		ug/kg	97	--
Dibenzo(a,h)anthracene	ND		ug/kg	68	--
Indeno(1,2,3-cd)pyrene	ND		ug/kg	130	--
Pyrene	ND		ug/kg	97	--
2-Methylnaphthalene	ND		ug/kg	68	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	98		30-130
2-Fluorobiphenyl	77		30-130
4-Terphenyl-d14	83		30-130

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2400301
Report Date: 01/12/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E-SIM
Analytical Date: 01/11/24 10:53
Analyst: AMV

Extraction Method: EPA 3570
Extraction Date: 01/09/24 23:00

Parameter	Result	Qualifier	Units	RL	MDL
MCP 1,4 Dioxane by 8270E-SIM - Mansfield Lab for sample(s): 02 Batch: WG1872485-1					
1,4-Dioxane	ND		ug/kg	8.00	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,4-Dioxane-d8	66		15-110

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2400301

Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG1870800-2 WG1870800-3								
Acenaphthene	69		70		40-140	1		30
Fluoranthene	73		72		40-140	1		30
Naphthalene	75		73		40-140	3		30
Benzo(a)anthracene	79		76		40-140	4		30
Benzo(a)pyrene	80		75		40-140	6		30
Benzo(b)fluoranthene	79		69		40-140	14		30
Benzo(k)fluoranthene	72		77		40-140	7		30
Chrysene	80		75		40-140	6		30
Acenaphthylene	70		72		40-140	3		30
Anthracene	75		72		40-140	4		30
Benzo(ghi)perylene	74		72		40-140	3		30
Fluorene	70		71		40-140	1		30
Phenanthrene	74		71		40-140	4		30
Dibenzo(a,h)anthracene	79		75		40-140	5		30
Indeno(1,2,3-cd)pyrene	78		74		40-140	5		30
Pyrene	74		73		40-140	1		30
2-Methylnaphthalene	71		72		40-140	1		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2400301
Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG1870800-2 WG1870800-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Nitrobenzene-d5	94		93		30-130
2-Fluorobiphenyl	72		70		30-130
4-Terphenyl-d14	78		74		30-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2400301

Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP 1,4 Dioxane by 8270E-SIM - Mansfield Lab Associated sample(s): 02 Batch: WG1872485-2 WG1872485-3								
1,4-Dioxane	118		118		40-140	0		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,4-Dioxane-d8	62		64		15-110

PETROLEUM HYDROCARBONS

Project Name: LEDGE RD LANDFILL
Lab Number: L2400301
Project Number: 289302
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-01
Client ID: WRA-3
Sample Location: ANDOVER, MA

Date Collected: 01/03/24 11:00
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 1,8015D(M)
Analytical Date: 01/04/24 07:32
Analyst: CRE
Percent Solids: 85%

Extraction Method: EPA 3546
Extraction Date: 01/03/24 23:42

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C10-C36)	ND		ug/kg	37100	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	90		40-140

Project Name: LEDGE RD LANDFILL
Lab Number: L2400301
Project Number: 289302
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-02
Client ID: WRA-4
Sample Location: ANDOVER, MA

Date Collected: 01/03/24 11:50
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 1,8015D(M)
Analytical Date: 01/04/24 08:21
Analyst: CRE
Percent Solids: 73%

Extraction Method: EPA 3546
Extraction Date: 01/03/24 23:42

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C10-C36)	120000		ug/kg	42800	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	79		40-140

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2400301
Report Date: 01/12/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015D(M)
Analytical Date: 01/04/24 09:03
Analyst: CRE

Extraction Method: EPA 3546
Extraction Date: 01/03/24 03:57

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbon Quantitation - Westborough Lab for sample(s): 01-02 Batch: WG1870358-1					
TPH (C10-C36)	ND		ug/kg	32700	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	67		40-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2400301

Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 01-02 Batch: WG1870358-2								
TPH (C10-C36)	72		-		40-140	-		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
o-Terphenyl	64				40-140

PCBS

Project Name: LEDGE RD LANDFILL
Lab Number: L2400301
Project Number: 289302
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-01
Client ID: WRA-3
Sample Location: ANDOVER, MA

Date Collected: 01/03/24 11:00
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8082A
Analytical Date: 01/04/24 07:43
Analyst: MHG
Percent Solids: 85%

Extraction Method: EPA 3546
Extraction Date: 01/03/24 23:45
Cleanup Method: EPA 3665A
Cleanup Date: 01/04/24
Cleanup Method: EPA 3660B
Cleanup Date: 01/04/24

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	56.8	--	1	A
Aroclor 1221	ND		ug/kg	56.8	--	1	A
Aroclor 1232	ND		ug/kg	56.8	--	1	A
Aroclor 1242	ND		ug/kg	56.8	--	1	A
Aroclor 1248	ND		ug/kg	56.8	--	1	A
Aroclor 1254	ND		ug/kg	56.8	--	1	A
Aroclor 1260	ND		ug/kg	56.8	--	1	A
Aroclor 1262	ND		ug/kg	56.8	--	1	A
Aroclor 1268	ND		ug/kg	56.8	--	1	A
PCBs, Total	ND		ug/kg	56.8	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	64		30-150	A
Decachlorobiphenyl	47		30-150	A
2,4,5,6-Tetrachloro-m-xylene	66		30-150	B
Decachlorobiphenyl	49		30-150	B

Project Name: LEDGE RD LANDFILL
Lab Number: L2400301
Project Number: 289302
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-02
Client ID: WRA-4
Sample Location: ANDOVER, MA

Date Collected: 01/03/24 11:50
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8082A
Analytical Date: 01/04/24 07:50
Analyst: MHG
Percent Solids: 73%

Extraction Method: EPA 3546
Extraction Date: 01/03/24 23:45
Cleanup Method: EPA 3665A
Cleanup Date: 01/04/24
Cleanup Method: EPA 3660B
Cleanup Date: 01/04/24

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	62.4	--	1	A
Aroclor 1221	ND		ug/kg	62.4	--	1	A
Aroclor 1232	ND		ug/kg	62.4	--	1	A
Aroclor 1242	154		ug/kg	62.4	--	1	A
Aroclor 1248	ND		ug/kg	62.4	--	1	A
Aroclor 1254	ND		ug/kg	62.4	--	1	B
Aroclor 1260	ND		ug/kg	62.4	--	1	A
Aroclor 1262	ND		ug/kg	62.4	--	1	A
Aroclor 1268	ND		ug/kg	62.4	--	1	A
PCBs, Total	154		ug/kg	62.4	--	1	B

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	63		30-150	A
Decachlorobiphenyl	49		30-150	A
2,4,5,6-Tetrachloro-m-xylene	62		30-150	B
Decachlorobiphenyl	51		30-150	B

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2400301
Report Date: 01/12/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082A
Analytical Date: 01/04/24 07:09
Analyst: AKM

Extraction Method: EPA 3546
Extraction Date: 01/03/24 18:37
Cleanup Method: EPA 3665A
Cleanup Date: 01/04/24
Cleanup Method: EPA 3660B
Cleanup Date: 01/04/24

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01-02 Batch: WG1870751-1						
Aroclor 1016	ND		ug/kg	48.9	--	A
Aroclor 1221	ND		ug/kg	48.9	--	A
Aroclor 1232	ND		ug/kg	48.9	--	A
Aroclor 1242	ND		ug/kg	48.9	--	A
Aroclor 1248	ND		ug/kg	48.9	--	A
Aroclor 1254	ND		ug/kg	48.9	--	A
Aroclor 1260	ND		ug/kg	48.9	--	A
Aroclor 1262	ND		ug/kg	48.9	--	A
Aroclor 1268	ND		ug/kg	48.9	--	A
PCBs, Total	ND		ug/kg	48.9	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	63		30-150	A
Decachlorobiphenyl	44		30-150	A
2,4,5,6-Tetrachloro-m-xylene	63		30-150	B
Decachlorobiphenyl	48		30-150	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2400301

Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01-02 Batch: WG1870751-2 WG1870751-3									
Aroclor 1016	65		66		40-140	2		30	A
Aroclor 1260	53		55		40-140	4		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	60		62		30-150	A
Decachlorobiphenyl	43		45		30-150	A
2,4,5,6-Tetrachloro-m-xylene	59		61		30-150	B
Decachlorobiphenyl	46		46		30-150	B

METALS

Project Name: LEDGE RD LANDFILL
Lab Number: L2400301
Project Number: 289302
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-01
Client ID: WRA-3
Sample Location: ANDOVER, MA
Date Collected: 01/03/24 11:00
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 85%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.34	--	1	01/04/24 00:42	01/04/24 09:20	EPA 3050B	97,6010D	DMC
Arsenic, Total	10.9		mg/kg	0.467	--	1	01/04/24 00:42	01/04/24 09:20	EPA 3050B	97,6010D	DMC
Barium, Total	16.1		mg/kg	0.467	--	1	01/04/24 00:42	01/04/24 09:20	EPA 3050B	97,6010D	DMC
Beryllium, Total	0.457		mg/kg	0.234	--	1	01/04/24 00:42	01/04/24 09:20	EPA 3050B	97,6010D	DMC
Cadmium, Total	ND		mg/kg	0.467	--	1	01/04/24 00:42	01/04/24 09:20	EPA 3050B	97,6010D	DMC
Chromium, Total	23.9		mg/kg	0.467	--	1	01/04/24 00:42	01/04/24 09:20	EPA 3050B	97,6010D	DMC
Lead, Total	8.48		mg/kg	2.34	--	1	01/04/24 00:42	01/04/24 09:20	EPA 3050B	97,6010D	DMC
Mercury, Total	ND		mg/kg	0.085	--	1	01/04/24 01:06	01/04/24 09:10	EPA 7471B	97,7471B	GMG
Nickel, Total	19.1		mg/kg	1.17	--	1	01/04/24 00:42	01/04/24 09:20	EPA 3050B	97,6010D	DMC
Selenium, Total	ND		mg/kg	2.34	--	1	01/04/24 00:42	01/04/24 09:20	EPA 3050B	97,6010D	DMC
Silver, Total	ND		mg/kg	0.467	--	1	01/04/24 00:42	01/04/24 09:20	EPA 3050B	97,6010D	DMC
Thallium, Total	ND		mg/kg	2.34	--	1	01/04/24 00:42	01/04/24 09:20	EPA 3050B	97,6010D	DMC
Vanadium, Total	17.4		mg/kg	0.467	--	1	01/04/24 00:42	01/04/24 09:20	EPA 3050B	97,6010D	DMC
Zinc, Total	56.9		mg/kg	2.34	--	1	01/04/24 00:42	01/04/24 09:20	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL
Lab Number: L2400301
Project Number: 289302
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-02
Client ID: WRA-4
Sample Location: ANDOVER, MA
Date Collected: 01/03/24 11:50
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 73%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.66	--	1	01/04/24 00:42	01/04/24 09:25	EPA 3050B	97,6010D	DMC
Arsenic, Total	9.07		mg/kg	0.533	--	1	01/04/24 00:42	01/04/24 09:25	EPA 3050B	97,6010D	DMC
Barium, Total	27.8		mg/kg	0.533	--	1	01/04/24 00:42	01/04/24 09:25	EPA 3050B	97,6010D	DMC
Beryllium, Total	ND		mg/kg	0.266	--	1	01/04/24 00:42	01/04/24 09:25	EPA 3050B	97,6010D	DMC
Cadmium, Total	ND		mg/kg	0.533	--	1	01/04/24 00:42	01/04/24 09:25	EPA 3050B	97,6010D	DMC
Chromium, Total	15.2		mg/kg	0.533	--	1	01/04/24 00:42	01/04/24 09:25	EPA 3050B	97,6010D	DMC
Lead, Total	21.4		mg/kg	2.66	--	1	01/04/24 00:42	01/04/24 09:25	EPA 3050B	97,6010D	DMC
Mercury, Total	ND		mg/kg	0.099	--	1	01/04/24 01:06	01/04/24 09:20	EPA 7471B	97,7471B	GMG
Nickel, Total	9.22		mg/kg	1.33	--	1	01/04/24 00:42	01/04/24 09:25	EPA 3050B	97,6010D	DMC
Selenium, Total	ND		mg/kg	2.66	--	1	01/04/24 00:42	01/04/24 09:25	EPA 3050B	97,6010D	DMC
Silver, Total	ND		mg/kg	0.533	--	1	01/04/24 00:42	01/04/24 09:25	EPA 3050B	97,6010D	DMC
Thallium, Total	ND		mg/kg	2.66	--	1	01/04/24 00:42	01/04/24 09:25	EPA 3050B	97,6010D	DMC
Vanadium, Total	12.1		mg/kg	0.533	--	1	01/04/24 00:42	01/04/24 09:25	EPA 3050B	97,6010D	DMC
Zinc, Total	34.3		mg/kg	2.66	--	1	01/04/24 00:42	01/04/24 09:25	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL **Lab Number:** L2400301

Project Number: 289302 **Report Date:** 01/12/24

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-02 Batch: WG1870778-1										
Antimony, Total	ND		mg/kg	2.00	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Arsenic, Total	ND		mg/kg	0.400	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Barium, Total	ND		mg/kg	0.400	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Beryllium, Total	ND		mg/kg	0.200	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Cadmium, Total	ND		mg/kg	0.400	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Chromium, Total	ND		mg/kg	0.400	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Lead, Total	ND		mg/kg	2.00	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Nickel, Total	ND		mg/kg	1.00	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Selenium, Total	ND		mg/kg	2.00	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Silver, Total	ND		mg/kg	0.400	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Thallium, Total	ND		mg/kg	2.00	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Vanadium, Total	ND		mg/kg	0.400	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC
Zinc, Total	ND		mg/kg	2.00	--	1	01/04/24 00:42	01/04/24 07:51	97,6010D	DMC

Prep Information

Digestion Method: EPA 3050B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-02 Batch: WG1870779-1										
Mercury, Total	ND		mg/kg	0.083	--	1	01/04/24 01:06	01/04/24 08:47	97,7471B	GMG

Prep Information

Digestion Method: EPA 7471B

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2400301

Report Date: 01/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1870778-2 WG1870778-3 SRM Lot Number: D122-540								
Antimony, Total	164		158		6-194	4		30
Arsenic, Total	109		104		81-119	5		30
Barium, Total	104		91		83-117	13		30
Beryllium, Total	104		101		83-117	3		30
Cadmium, Total	102		98		83-117	4		30
Chromium, Total	101		97		82-118	4		30
Lead, Total	105		101		83-117	4		30
Nickel, Total	105		101		83-117	4		30
Selenium, Total	117		113		81-119	3		30
Silver, Total	104		100		80-120	4		30
Thallium, Total	109		106		81-119	3		30
Vanadium, Total	96		92		80-120	4		30
Zinc, Total	102		99		82-119	3		30
MCP Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1870779-2 WG1870779-3 SRM Lot Number: D122-540								
Mercury, Total	102		96		73-127	6		30

INORGANICS
&
MISCELLANEOUS

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2400301
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-01
Client ID: WRA-3
Sample Location: ANDOVER, MA

Date Collected: 01/03/24 11:00
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	85.2		%	0.100	NA	1	-	01/03/24 16:59	121,2540G	SJB

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2400301
Report Date: 01/12/24

SAMPLE RESULTS

Lab ID: L2400301-02
Client ID: WRA-4
Sample Location: ANDOVER, MA

Date Collected: 01/03/24 11:50
Date Received: 01/03/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	73.4		%	0.100	NA	1	-	01/03/24 16:59	121,2540G	SJB

Lab Duplicate Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2400301

Report Date: 01/12/24

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1870710-1 QC Sample: L2400301-01 Client ID: WRA-3						
Solids, Total	85.2	86.2	%	1		20

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2400301
Report Date: 01/12/24

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2400301-01A	Vial MeOH preserved	A	NA		3.3	Y	Absent		MCP-8260HLW-21(14)
L2400301-01B	Vial water preserved	A	NA		3.3	Y	Absent	03-JAN-24 15:17	MCP-8260HLW-21(14)
L2400301-01C	Vial water preserved	A	NA		3.3	Y	Absent	03-JAN-24 15:17	MCP-8260HLW-21(14)
L2400301-01D	Plastic 2oz unpreserved for TS	A	NA		3.3	Y	Absent		TS(7)
L2400301-01E	Metals Only-Glass 60mL/2oz unpreserved	A	NA		3.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-TL-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-ZN-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L2400301-01F	Glass 250ml/8oz unpreserved	A	NA		3.3	Y	Absent		MCP-8082-10(365),MCP-PAH-21(14),TPH-DRO-D(14)
L2400301-02A	Vial MeOH preserved	A	NA		3.3	Y	Absent		MCP-8260HLW-21(14)
L2400301-02B	Vial water preserved	A	NA		3.3	Y	Absent	03-JAN-24 15:17	MCP-8260HLW-21(14)
L2400301-02C	Vial water preserved	A	NA		3.3	Y	Absent	03-JAN-24 15:17	MCP-8260HLW-21(14)
L2400301-02D	Plastic 2oz unpreserved for TS	A	NA		3.3	Y	Absent		TS(7)
L2400301-02E	Metals Only-Glass 60mL/2oz unpreserved	A	NA		3.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-TL-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-ZN-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L2400301-02F	Glass 250ml/8oz unpreserved	A	NA		3.3	Y	Absent		MCP-8082-10(365),A2-MCP-14DX-SIM-21(14),MCP-PAH-21(14),TPH-DRO-D(14)
L2400301-03A	Vial MeOH preserved	A	NA		3.3	Y	Absent		HOLD-8260HLW(14)
L2400301-03B	Vial water preserved	A	NA		3.3	Y	Absent	03-JAN-24 15:17	HOLD-8260HLW(14)

*Values in parentheses indicate holding time in days

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2400301
Project Number:	289302	**Report Date:**	01/12/24

GLOSSARY

Acronyms

DL - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EMPC - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LOD - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

LOQ - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

NR - No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TEF - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.

TEQ - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2400301
Project Number:	289302	**Report Date:**	01/12/24

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2400301
Project Number:	289302	**Report Date:**	01/12/24

Data Qualifiers

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: Data Usability Report

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2400301
Report Date: 01/12/24

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

141 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA and IIB, November 2021.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE ____ OF ____

Date Rec'd in Lab: 1/3/24

ALPHA Job #: L2400301

ALPHA ANALYTICAL
8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220
320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Client Information

Client: CDM Smith

Address: 75 State Street, Suite 701
Boston MA 02109

Phone: 617-452-6563

Email: JonesNE@cdmsmith.com

Project Information

Project Name: Ledge Rd Landfill

Project Location: Andover, MA

Project #: 289302

Project Manager: Nathan Jones

ALPHA Quote #:

Report Information - Data Deliverables

☑ ADEx ☑ EMAIL

Billing Information

☐ Same as Client Info PO #:

Regulatory Requirements & Project Information Requirements

☑ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☑ No CT RCP Analytical Methods
☐ Yes ☑ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☑ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☑ No NPDES RGP
☐ Other State /Fed Program _____ Criteria _____

Turn-Around Time

☐ Standard ☑ RUSH (only confirmed if pre-approved)

Date Due: 2 day TAT

Additional Project Information:

Detection limits for each parameter shall be less than reportable concentrations for RCS-1 Criteria

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	VOC: ☑ 8260 ☐ 624	SVOC: ☐ 8270 ☐ 624.2	METALS: ☐ ASIN ☐ PAH	METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15	GRO: ☐ Ranges & Targets ☐ RCRA8 ☐ PP13	VPH: ☐ Ranges & Targets ☐ Ranges Only	☐ PCB ☐ PEST	TPH: ☐ Quant Only ☐ Fingerprint	PAH - EPA 8270	TPH - MassDEP Modified	PCBs - EPA 8082	SAMPLE INFO: Filtration ☐ Field ☐ Lab to do; Preservation ☐ Lab to do	Sample Comments	TOTAL # BOTTLES
00301-01	WRA-3	1/3/24	11:30	Soil	ET	X		X						X	X	X			
-02	WRA-4	1/3/24	11:20	Soil	ET	X		X						X	X	X			

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H = NaS_2O_3
I= Ascorbic Acid
J = NH_4Cl
K= Zn Acetate
O= Other

	Container Type																		
	Preservative																		

Relinquished By:	Date/Time	Received By:	Date/Time
	1/3/24 14:52		1/3/24 1432

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

Method Blank Summary
Form 4
Volatiles

Client	: CDM Smith, Inc.	**Lab Number**	: L2400301
Project Name	: LEDGE RD LANDFILL	**Project Number**	: 289302
Lab Sample ID	: WG1871046-5	**Lab File ID**	: V29240104A05
Instrument ID	: VOA129		
Matrix	: SOIL	**Analysis Date**	: 01/04/24 09:41

Client Sample No.	Lab Sample ID	Analysis Date
WG1871046-3LCS	WG1871046-3	01/04/24 08:17
WG1871046-4LCSD	WG1871046-4	01/04/24 08:38
WRA-3	L2400301-01	01/04/24 11:25
WRA-4	L2400301-02	01/04/24 11:46

Calibration Verification Summary
Form 7
Volatiles

Client	: CDM Smith, Inc.		**Lab Number**	: L2400301	
Project Name	: LEDGE RD LANDFILL		**Project Number**	: 289302	
Instrument ID	: VOA129		**Calibration Date**	: 01/04/24 08:17	
Lab File ID	: V29240104A01		**Init. Calib. Date(s)**	: 12/19/23	12/20/23
Sample No	: WG1871046-2		**Init. Calib. Times**	: 21:48	01:16
Channel	:				

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
Fluorobenzene	1	1	-	0	20	87	0
Dichlorodifluoromethane	0.332	0.167	-	49.7*	20	41	0
Chloromethane	0.42	0.377	-	10.2	20	74	0
Vinyl chloride	0.377	0.317	-	15.9	20	69	0
Bromomethane	0.185	0.153	-	17.3	20	76	0
Chloroethane	0.206	0.195	-	5.3	20	78	0
Trichlorofluoromethane	0.367	0.311	-	15.3	20	69	0
Ethyl ether	0.13	0.115	-	11.5	20	75	0
1,1-Dichloroethene	0.225	0.184	-	18.2	20	68	0
Carbon disulfide	0.786	0.63	-	19.8	20	66	0
Freon-113	0.237	0.201	-	15.2	20	67	0
Acrolein	40	35.033	-	12.4	20	78	0
Methylene chloride	40	34.114	-	14.7	20	71	0
Acetone	40	33.042	-	17.4	20	76	0
trans-1,2-Dichloroethene	0.255	0.218	-	14.5	20	71	0
Methyl acetate	0.254	0.217	-	14.6	20	80	0
Methyl tert-butyl ether	0.671	0.598	-	10.9	20	72	-.01
tert-Butyl alcohol	0.045	0.03	-	33.3*	20	63	-.02
Diisopropyl ether	1.023	1.43	-	-39.8*	20	112	-.01
1,1-Dichloroethane	0.563	0.579	-	-2.8	20	86	0
Halothane	0.193	0.161	-	16.6	20	69	0
Acrylonitrile	0.108	0.11	-	-1.9	20	91	0
Ethyl tert-butyl ether	0.907	0.869	-	4.2	20	76	-.01
Vinyl acetate	0.658	0.633	-	3.8	20	79	0
cis-1,2-Dichloroethene	0.289	0.236	-	18.3	20	67	0
2,2-Dichloropropane	0.35	0.265	-	24.3*	20	63	0
Bromochloromethane	0.134	0.106	-	20.9*	20	67	0
Cyclohexane	0.555	0.539	-	2.9	20	76	0
Chloroform	0.485	0.424	-	12.6	20	72	0
Ethyl acetate	0.302	0.274	-	9.3	20	76	0
Carbon tetrachloride	0.313	0.271	-	13.4	20	69	0
Tetrahydrofuran	0.112	0.093	-	17	20	74	0
Dibromofluoromethane	0.252	0.238	-	5.6	20	82	0
1,1,1-Trichloroethane	0.381	0.336	-	11.8	20	68	0
2-Butanone	0.151	0.124	-	17.9	20	73	0
1,1-Dichloropropene	0.343	0.323	-	5.8	20	73	0
Benzene	0.99	0.901	-	9	20	72	0
tert-Amyl methyl ether	0.633	0.515	-	18.6	20	65	0
1,2-Dichloroethane-d4	0.321	0.333	-	-3.7	20	92	0
1,2-Dichloroethane	0.417	0.389	-	6.7	20	77	0
Methyl cyclohexane	0.428	0.371	-	13.3	20	67	0
Trichloroethene	0.26	0.242	-	6.9	20	72	0
Dibromomethane	0.162	0.134	-	17.3	20	69	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: CDM Smith, Inc.	**Lab Number**	: L2400301
Project Name	: LEDGE RD LANDFILL	**Project Number**	: 289302
Instrument ID	: VOA129	**Calibration Date**	: 01/04/24 08:17
Lab File ID	: V29240104A01	**Init. Calib. Date(s)**	: 12/19/23 12/20/23
Sample No	: WG1871046-2	**Init. Calib. Times**	: 21:48 01:16
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
1,2-Dichloropropane	0.306	0.296	-	3.3	20	77	0
2-Chloroethyl vinyl ether	0.184	0.16	-	13	20	71	-.03
Bromodichloromethane	0.336	0.309	-	8	20	73	0
1,4-Dioxane	0.00323	0.00243*	-	24.8*	20	65	0
cis-1,3-Dichloropropene	0.366	0.326	-	10.9	20	68	0
Chlorobenzene-d5	1	1	-	0	20	88	0
Toluene-d8	1.302	1.256	-	3.5	20	85	0
Toluene	0.875	0.753	-	13.9	20	71	0
4-Methyl-2-pentanone	0.155	0.133	-	14.2	20	70	0
Tetrachloroethene	0.338	0.288	-	14.8	20	67	0
trans-1,3-Dichloropropene	0.445	0.37	-	16.9	20	67	0
Ethyl methacrylate	0.351	0.304	-	13.4	20	70	0
1,1,2-Trichloroethane	0.248	0.223	-	10.1	20	74	0
Chlorodibromomethane	0.307	0.269	-	12.4	20	69	0
1,3-Dichloropropane	0.508	0.457	-	10	20	73	0
1,2-Dibromoethane	0.274	0.241	-	12	20	70	0
2-Hexanone	0.275	0.25	-	9.1	20	75	0
Chlorobenzene	0.945	0.826	-	12.6	20	71	0
Ethylbenzene	1.663	1.502	-	9.7	20	74	0
1,1,1,2-Tetrachloroethane	40	31.36	-	21.6*	20	69	0
p/m Xylene	0.625	0.561	-	10.2	20	72	0
o Xylene	0.606	0.539	-	11.1	20	72	0
Styrene	0.997	0.919	-	7.8	20	72	0
1,4-Dichlorobenzene-d4	1	1	-	0	20	90	0
Bromoform	0.388	0.303	-	21.9*	20	65	0
Isopropylbenzene	3.156	2.888	-	8.5	20	73	0
4-Bromofluorobenzene	0.963	0.931	-	3.3	20	86	0
Bromobenzene	0.786	0.658	-	16.3	20	69	0
n-Propylbenzene	3.818	3.593	-	5.9	20	76	0
1,4-Dichlorobutane	1.245	1.214	-	2.5	20	81	0
1,1,2,2-Tetrachloroethane	0.713	0.629	-	11.8	20	70	0
4-Ethyltoluene	3.149	2.953	-	6.2	20	75	0
2-Chlorotoluene	2.37	2.474	-	-4.4	20	86	0
1,3,5-Trimethylbenzene	2.79	2.526	-	9.5	20	73	0
1,2,3-Trichloropropane	0.642	0.552	-	14	20	72	0
trans-1,4-Dichloro-2-buten	0.263	0.251	-	4.6	20	83	0
4-Chlorotoluene	2.434	2.235	-	8.2	20	75	0
tert-Butylbenzene	2.31	2.086	-	9.7	20	74	0
1,2,4-Trimethylbenzene	2.69	2.479	-	7.8	20	74	0
sec-Butylbenzene	3.438	3.194	-	7.1	20	74	0
p-Isopropyltoluene	2.933	2.728	-	7	20	75	0
1,3-Dichlorobenzene	1.526	1.324	-	13.2	20	71	0
1,4-Dichlorobenzene	1.552	1.32	-	14.9	20	71	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: CDM Smith, Inc.		**Lab Number**	: L2400301	
Project Name	: LEDGE RD LANDFILL		**Project Number**	: 289302	
Instrument ID	: VOA129		**Calibration Date**	: 01/04/24 08:17	
Lab File ID	: V29240104A01		**Init. Calib. Date(s)**	: 12/19/23	12/20/23
Sample No	: WG1871046-2		**Init. Calib. Times**	: 21:48	01:16
Channel	:				

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
p-Diethylbenzene	1.805	1.669	-	7.5	20	74	0
n-Butylbenzene	2.679	2.646	-	1.2	20	79	0
1,2-Dichlorobenzene	1.438	1.231	-	14.4	20	72	0
1,2,4,5-Tetramethylbenzene	2.739	2.57	-	6.2	20	75	0
1,2-Dibromo-3-chloropropan	0.115	0.085	-	26.1*	20	64	0
1,3,5-Trichlorobenzene	1.142	1.015	-	11.1	20	75	0
Hexachlorobutadiene	0.554	0.447	-	19.3	20	66	0
1,2,4-Trichlorobenzene	1.012	0.918	-	9.3	20	75	0
Naphthalene	2.453	2.018	-	17.7	20	68	0
1,2,3-Trichlorobenzene	0.973	0.829	-	14.8	20	72	0

* Value outside of QC limits.

ANALYTICAL REPORT

Lab Number:	L2403791
Client:	CDM Smith, Inc. 75 State Street Suite 701 Boston, MA 02109
ATTN:	Nathan Jones
Phone:	(617) 452-6563
Project Name:	LEDGE RD LANDFILL
Project Number:	289302
Report Date:	01/25/24

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Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2403791
Report Date: 01/25/24

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2403791-01	WRA-1-S	SOIL	ANDOVER, MA	01/22/24 11:30	01/23/24
L2403791-02	WRA-1-N	SOIL	ANDOVER, MA	01/23/24 08:00	01/23/24

Project Name: LEDGE RD LANDFILL **Lab Number:** L2403791

Project Number: 289302 **Report Date:** 01/25/24

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	NO

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2403791
Project Number:	289302	**Report Date:**	01/25/24

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: LEDGE RD LANDFILL **Lab Number:** L2403791
Project Number: 289302 **Report Date:** 01/25/24

Case Narrative (continued)

MCP Related Narratives

Sample Receipt

The analyses performed were specified by the client.

In reference to question H:

A Matrix Spike was not submitted for the analysis of Total Metals.

Volatile Organics

L2403791-01 and -02: Initial calibration utilized a quadratic fit for: 1,1,1,2-tetrachloroethane

In reference to question H:

L2403791-01 and -02: Initial Calibration did not meet:

Lowest Calibration Standard Minimum Response Factor: trichloroethene (0.1904), bromodichloromethane (0.2472), 1,4-dioxane (0.0032), cis-1,3-dichloropropene (0.2490)

Average Response Factor: 1,4-dioxane

Verification: dichlorodifluoromethane (62%)

L2403791-01 and -02: The associated continuing calibration standard is outside the acceptance criteria for several compounds; however, it is within overall method allowances. Associated results are considered to be biased high if the %D is negative and biased low if the %D is positive. A copy of the continuing calibration standard is included as an addendum to this report.

Semivolatile Organics

In reference to question I:

All samples were analyzed for a subset of MCP analytes per client request.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Michelle M. Morris

Title: Technical Director/Representative Date: 01/25/24

QC OUTLIER SUMMARY REPORT

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2403791
Report Date: 01/25/24

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment
MCP Volatile Organics by EPA 5035 Low - Westborough Lab								
8260D	Batch QC	WG1877777-3	Dichlorodifluoromethane	LCS	61	70-130	02	potential low bias
8260D	Batch QC	WG1877777-3	Acetone	LCS	63	70-130	02	potential low bias
8260D	Batch QC	WG1877777-3	1,4-Dioxane	LCS	61	70-130	02	potential low bias
8260D	Batch QC	WG1877777-4	Dichlorodifluoromethane	LCSD	56	70-130	02	potential low bias
8260D	Batch QC	WG1877777-4	Acetone	LCSD	64	70-130	02	potential low bias
8260D	Batch QC	WG1877777-4	1,4-Dioxane	LCSD	65	70-130	02	potential low bias
8260D	Batch QC	WG1878014-3	1,2-Dibromo-3-chloropropane	LCS	68	70-130	01	potential low bias
8260D	Batch QC	WG1878014-3	1,4-Dioxane	LCS	60	70-130	01	potential low bias
8260D	Batch QC	WG1878014-4	1,4-Dioxane	LCSD	62	70-130	01	potential low bias
MCP Semivolatile Organics - Westborough Lab								
8270E	Batch QC (L2403791-02)	WG1877486-5	Pyrene	Duplicate	83	30	01-02	non-directional bias

ORGANICS

VOLATILES

Project Name: LEDGE RD LANDFILL **Lab Number:** L2403791

Project Number: 289302 **Report Date:** 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-01 Date Collected: 01/22/24 11:30
Client ID: WRA-1-S Date Received: 01/23/24
Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8260D
Analytical Date: 01/24/24 23:43
Analyst: JIC
Percent Solids: 54%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Methylene chloride	ND		ug/kg	46	--	1
1,1-Dichloroethane	ND		ug/kg	9.2	--	1
Chloroform	ND		ug/kg	14	--	1
Carbon tetrachloride	ND		ug/kg	9.2	--	1
1,2-Dichloropropane	ND		ug/kg	9.2	--	1
Dibromochloromethane	ND		ug/kg	9.2	--	1
1,1,2-Trichloroethane	ND		ug/kg	9.2	--	1
Tetrachloroethene	ND		ug/kg	4.6	--	1
Chlorobenzene	ND		ug/kg	4.6	--	1
Trichlorofluoromethane	ND		ug/kg	37	--	1
1,2-Dichloroethane	ND		ug/kg	9.2	--	1
1,1,1-Trichloroethane	ND		ug/kg	4.6	--	1
Bromodichloromethane	ND		ug/kg	4.6	--	1
trans-1,3-Dichloropropene	ND		ug/kg	9.2	--	1
cis-1,3-Dichloropropene	ND		ug/kg	4.6	--	1
1,3-Dichloropropene, Total	ND		ug/kg	4.6	--	1
1,1-Dichloropropene	ND		ug/kg	4.6	--	1
Bromoform	ND		ug/kg	37	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	4.6	--	1
Benzene	ND		ug/kg	4.6	--	1
Toluene	ND		ug/kg	9.2	--	1
Ethylbenzene	ND		ug/kg	9.2	--	1
Chloromethane	ND		ug/kg	37	--	1
Bromomethane	ND		ug/kg	18	--	1
Vinyl chloride	ND		ug/kg	9.2	--	1
Chloroethane	ND		ug/kg	18	--	1
1,1-Dichloroethene	ND		ug/kg	9.2	--	1
trans-1,2-Dichloroethene	ND		ug/kg	14	--	1

Project Name: LEDGE RD LANDFILL **Lab Number:** L2403791

Project Number: 289302 **Report Date:** 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-01 Date Collected: 01/22/24 11:30

Client ID: WRA-1-S Date Received: 01/23/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Trichloroethene	ND		ug/kg	4.6	--	1
1,2-Dichlorobenzene	ND		ug/kg	18	--	1
1,3-Dichlorobenzene	ND		ug/kg	18	--	1
1,4-Dichlorobenzene	ND		ug/kg	18	--	1
Methyl tert butyl ether	ND		ug/kg	18	--	1
p/m-Xylene	ND		ug/kg	18	--	1
o-Xylene	ND		ug/kg	9.2	--	1
Xylenes, Total	ND		ug/kg	9.2	--	1
cis-1,2-Dichloroethene	ND		ug/kg	9.2	--	1
1,2-Dichloroethene, Total	ND		ug/kg	9.2	--	1
Dibromomethane	ND		ug/kg	18	--	1
1,2,3-Trichloropropane	ND		ug/kg	18	--	1
Styrene	ND		ug/kg	9.2	--	1
Dichlorodifluoromethane	ND		ug/kg	92	--	1
Acetone	1200		ug/kg	230	--	1
Carbon disulfide	ND		ug/kg	92	--	1
Methyl ethyl ketone	280		ug/kg	92	--	1
Methyl isobutyl ketone	ND		ug/kg	92	--	1
2-Hexanone	ND		ug/kg	92	--	1
Bromochloromethane	ND		ug/kg	18	--	1
Tetrahydrofuran	ND		ug/kg	37	--	1
2,2-Dichloropropane	ND		ug/kg	18	--	1
1,2-Dibromoethane	ND		ug/kg	9.2	--	1
1,3-Dichloropropane	ND		ug/kg	18	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	4.6	--	1
Bromobenzene	ND		ug/kg	18	--	1
n-Butylbenzene	ND		ug/kg	9.2	--	1
sec-Butylbenzene	ND		ug/kg	9.2	--	1
tert-Butylbenzene	ND		ug/kg	18	--	1
o-Chlorotoluene	ND		ug/kg	18	--	1
p-Chlorotoluene	ND		ug/kg	18	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	28	--	1
Hexachlorobutadiene	ND		ug/kg	37	--	1
Isopropylbenzene	ND		ug/kg	9.2	--	1
p-Isopropyltoluene	ND		ug/kg	9.2	--	1
Naphthalene	ND		ug/kg	37	--	1
n-Propylbenzene	ND		ug/kg	9.2	--	1

Project Name: LEDGE RD LANDFILL **Lab Number:** L2403791

Project Number: 289302 **Report Date:** 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-01 Date Collected: 01/22/24 11:30

Client ID: WRA-1-S Date Received: 01/23/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	18	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	18	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	18	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	18	--	1
Diethyl ether	ND		ug/kg	18	--	1
Diisopropyl Ether	ND		ug/kg	18	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	18	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	18	--	1
1,4-Dioxane	ND		ug/kg	740	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	116		70-130
Toluene-d8	107		70-130
4-Bromofluorobenzene	107		70-130
Dibromofluoromethane	108		70-130

Project Name: LEDGE RD LANDFILL **Lab Number:** L2403791

Project Number: 289302 **Report Date:** 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-02 Date Collected: 01/23/24 08:00
Client ID: WRA-1-N Date Received: 01/23/24
Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8260D
Analytical Date: 01/24/24 11:36
Analyst: SLS
Percent Solids: 72%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Methylene chloride	ND		ug/kg	24	--	1
1,1-Dichloroethane	ND		ug/kg	4.7	--	1
Chloroform	ND		ug/kg	7.1	--	1
Carbon tetrachloride	ND		ug/kg	4.7	--	1
1,2-Dichloropropane	ND		ug/kg	4.7	--	1
Dibromochloromethane	ND		ug/kg	4.7	--	1
1,1,2-Trichloroethane	ND		ug/kg	4.7	--	1
Tetrachloroethene	ND		ug/kg	2.4	--	1
Chlorobenzene	ND		ug/kg	2.4	--	1
Trichlorofluoromethane	ND		ug/kg	19	--	1
1,2-Dichloroethane	ND		ug/kg	4.7	--	1
1,1,1-Trichloroethane	ND		ug/kg	2.4	--	1
Bromodichloromethane	ND		ug/kg	2.4	--	1
trans-1,3-Dichloropropene	ND		ug/kg	4.7	--	1
cis-1,3-Dichloropropene	ND		ug/kg	2.4	--	1
1,3-Dichloropropene, Total	ND		ug/kg	2.4	--	1
1,1-Dichloropropene	ND		ug/kg	2.4	--	1
Bromoform	ND		ug/kg	19	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	2.4	--	1
Benzene	ND		ug/kg	2.4	--	1
Toluene	ND		ug/kg	4.7	--	1
Ethylbenzene	ND		ug/kg	4.7	--	1
Chloromethane	ND		ug/kg	19	--	1
Bromomethane	ND		ug/kg	9.5	--	1
Vinyl chloride	ND		ug/kg	4.7	--	1
Chloroethane	ND		ug/kg	9.5	--	1
1,1-Dichloroethene	ND		ug/kg	4.7	--	1
trans-1,2-Dichloroethene	ND		ug/kg	7.1	--	1

Project Name: LEDGE RD LANDFILL **Lab Number:** L2403791

Project Number: 289302 **Report Date:** 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-02 Date Collected: 01/23/24 08:00

Client ID: WRA-1-N Date Received: 01/23/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Trichloroethene	ND		ug/kg	2.4	--	1
1,2-Dichlorobenzene	ND		ug/kg	9.5	--	1
1,3-Dichlorobenzene	ND		ug/kg	9.5	--	1
1,4-Dichlorobenzene	ND		ug/kg	9.5	--	1
Methyl tert butyl ether	ND		ug/kg	9.5	--	1
p/m-Xylene	ND		ug/kg	9.5	--	1
o-Xylene	ND		ug/kg	4.7	--	1
Xylenes, Total	ND		ug/kg	4.7	--	1
cis-1,2-Dichloroethene	ND		ug/kg	4.7	--	1
1,2-Dichloroethene, Total	ND		ug/kg	4.7	--	1
Dibromomethane	ND		ug/kg	9.5	--	1
1,2,3-Trichloropropane	ND		ug/kg	9.5	--	1
Styrene	ND		ug/kg	4.7	--	1
Dichlorodifluoromethane	ND		ug/kg	47	--	1
Acetone	ND		ug/kg	120	--	1
Carbon disulfide	ND		ug/kg	47	--	1
Methyl ethyl ketone	ND		ug/kg	47	--	1
Methyl isobutyl ketone	ND		ug/kg	47	--	1
2-Hexanone	ND		ug/kg	47	--	1
Bromochloromethane	ND		ug/kg	9.5	--	1
Tetrahydrofuran	ND		ug/kg	19	--	1
2,2-Dichloropropane	ND		ug/kg	9.5	--	1
1,2-Dibromoethane	ND		ug/kg	4.7	--	1
1,3-Dichloropropane	ND		ug/kg	9.5	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	2.4	--	1
Bromobenzene	ND		ug/kg	9.5	--	1
n-Butylbenzene	ND		ug/kg	4.7	--	1
sec-Butylbenzene	ND		ug/kg	4.7	--	1
tert-Butylbenzene	ND		ug/kg	9.5	--	1
o-Chlorotoluene	ND		ug/kg	9.5	--	1
p-Chlorotoluene	ND		ug/kg	9.5	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	14	--	1
Hexachlorobutadiene	ND		ug/kg	19	--	1
Isopropylbenzene	ND		ug/kg	4.7	--	1
p-Isopropyltoluene	ND		ug/kg	4.7	--	1
Naphthalene	ND		ug/kg	19	--	1
n-Propylbenzene	ND		ug/kg	4.7	--	1

Project Name: LEDGE RD LANDFILL **Lab Number:** L2403791

Project Number: 289302 **Report Date:** 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-02 Date Collected: 01/23/24 08:00

Client ID: WRA-1-N Date Received: 01/23/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	9.5	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	9.5	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	9.5	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	9.5	--	1
Diethyl ether	ND		ug/kg	9.5	--	1
Diisopropyl Ether	ND		ug/kg	9.5	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	9.5	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	9.5	--	1
1,4-Dioxane	ND		ug/kg	380	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	108		70-130
Toluene-d8	102		70-130
4-Bromofluorobenzene	101		70-130
Dibromofluoromethane	104		70-130

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2403791
Report Date: 01/25/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 01/24/24 09:03
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 02 Batch: WG1877777-5					
Methylene chloride	ND		ug/kg	5.0	--
1,1-Dichloroethane	ND		ug/kg	1.0	--
Chloroform	ND		ug/kg	1.5	--
Carbon tetrachloride	ND		ug/kg	1.0	--
1,2-Dichloropropane	ND		ug/kg	1.0	--
Dibromochloromethane	ND		ug/kg	1.0	--
1,1,2-Trichloroethane	ND		ug/kg	1.0	--
Tetrachloroethene	ND		ug/kg	0.50	--
Chlorobenzene	ND		ug/kg	0.50	--
Trichlorofluoromethane	ND		ug/kg	4.0	--
1,2-Dichloroethane	ND		ug/kg	1.0	--
1,1,1-Trichloroethane	ND		ug/kg	0.50	--
Bromodichloromethane	ND		ug/kg	0.50	--
trans-1,3-Dichloropropene	ND		ug/kg	1.0	--
cis-1,3-Dichloropropene	ND		ug/kg	0.50	--
1,3-Dichloropropene, Total	ND		ug/kg	0.50	--
1,1-Dichloropropene	ND		ug/kg	0.50	--
Bromoform	ND		ug/kg	4.0	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.50	--
Benzene	ND		ug/kg	0.50	--
Toluene	ND		ug/kg	1.0	--
Ethylbenzene	ND		ug/kg	1.0	--
Chloromethane	ND		ug/kg	4.0	--
Bromomethane	ND		ug/kg	2.0	--
Vinyl chloride	ND		ug/kg	1.0	--
Chloroethane	ND		ug/kg	2.0	--
1,1-Dichloroethene	ND		ug/kg	1.0	--
trans-1,2-Dichloroethene	ND		ug/kg	1.5	--
Trichloroethene	ND		ug/kg	0.50	--

Project Name: LEDGE RD LANDFILL **Lab Number:** L2403791

Project Number: 289302 **Report Date:** 01/25/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 01/24/24 09:03
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 02 Batch: WG1877777-5					
1,2-Dichlorobenzene	ND		ug/kg	2.0	--
1,3-Dichlorobenzene	ND		ug/kg	2.0	--
1,4-Dichlorobenzene	ND		ug/kg	2.0	--
Methyl tert butyl ether	ND		ug/kg	2.0	--
p/m-Xylene	ND		ug/kg	2.0	--
o-Xylene	ND		ug/kg	1.0	--
Xylenes, Total	ND		ug/kg	1.0	--
cis-1,2-Dichloroethene	ND		ug/kg	1.0	--
1,2-Dichloroethene, Total	ND		ug/kg	1.0	--
Dibromomethane	ND		ug/kg	2.0	--
1,2,3-Trichloropropane	ND		ug/kg	2.0	--
Styrene	ND		ug/kg	1.0	--
Dichlorodifluoromethane	ND		ug/kg	10	--
Acetone	ND		ug/kg	25	--
Carbon disulfide	ND		ug/kg	10	--
Methyl ethyl ketone	ND		ug/kg	10	--
Methyl isobutyl ketone	ND		ug/kg	10	--
2-Hexanone	ND		ug/kg	10	--
Bromochloromethane	ND		ug/kg	2.0	--
Tetrahydrofuran	ND		ug/kg	4.0	--
2,2-Dichloropropane	ND		ug/kg	2.0	--
1,2-Dibromoethane	ND		ug/kg	1.0	--
1,3-Dichloropropane	ND		ug/kg	2.0	--
1,1,1,2-Tetrachloroethane	ND		ug/kg	0.50	--
Bromobenzene	ND		ug/kg	2.0	--
n-Butylbenzene	ND		ug/kg	1.0	--
sec-Butylbenzene	ND		ug/kg	1.0	--
tert-Butylbenzene	ND		ug/kg	2.0	--
o-Chlorotoluene	ND		ug/kg	2.0	--

Project Name: LEDGE RD LANDFILL **Lab Number:** L2403791

Project Number: 289302 **Report Date:** 01/25/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 01/24/24 09:03
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 02 Batch: WG1877777-5					
p-Chlorotoluene	ND		ug/kg	2.0	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	3.0	--
Hexachlorobutadiene	ND		ug/kg	4.0	--
Isopropylbenzene	ND		ug/kg	1.0	--
p-Isopropyltoluene	ND		ug/kg	1.0	--
Naphthalene	ND		ug/kg	4.0	--
n-Propylbenzene	ND		ug/kg	1.0	--
1,2,3-Trichlorobenzene	ND		ug/kg	2.0	--
1,2,4-Trichlorobenzene	ND		ug/kg	2.0	--
1,3,5-Trimethylbenzene	ND		ug/kg	2.0	--
1,2,4-Trimethylbenzene	ND		ug/kg	2.0	--
Diethyl ether	ND		ug/kg	2.0	--
Diisopropyl Ether	ND		ug/kg	2.0	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	2.0	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	2.0	--
1,4-Dioxane	ND		ug/kg	80	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	113		70-130
Toluene-d8	102		70-130
4-Bromofluorobenzene	101		70-130
Dibromofluoromethane	105		70-130

Project Name: LEDGE RD LANDFILL **Lab Number:** L2403791

Project Number: 289302 **Report Date:** 01/25/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 01/24/24 19:34
Analyst: SLS

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1878014-5					
Methylene chloride	ND		ug/kg	5.0	--
1,1-Dichloroethane	ND		ug/kg	1.0	--
Chloroform	ND		ug/kg	1.5	--
Carbon tetrachloride	ND		ug/kg	1.0	--
1,2-Dichloropropane	ND		ug/kg	1.0	--
Dibromochloromethane	ND		ug/kg	1.0	--
1,1,2-Trichloroethane	ND		ug/kg	1.0	--
Tetrachloroethene	ND		ug/kg	0.50	--
Chlorobenzene	ND		ug/kg	0.50	--
Trichlorofluoromethane	ND		ug/kg	4.0	--
1,2-Dichloroethane	ND		ug/kg	1.0	--
1,1,1-Trichloroethane	ND		ug/kg	0.50	--
Bromodichloromethane	ND		ug/kg	0.50	--
trans-1,3-Dichloropropene	ND		ug/kg	1.0	--
cis-1,3-Dichloropropene	ND		ug/kg	0.50	--
1,3-Dichloropropene, Total	ND		ug/kg	0.50	--
1,1-Dichloropropene	ND		ug/kg	0.50	--
Bromoform	ND		ug/kg	4.0	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.50	--
Benzene	ND		ug/kg	0.50	--
Toluene	ND		ug/kg	1.0	--
Ethylbenzene	ND		ug/kg	1.0	--
Chloromethane	ND		ug/kg	4.0	--
Bromomethane	ND		ug/kg	2.0	--
Vinyl chloride	ND		ug/kg	1.0	--
Chloroethane	ND		ug/kg	2.0	--
1,1-Dichloroethene	ND		ug/kg	1.0	--
trans-1,2-Dichloroethene	ND		ug/kg	1.5	--
Trichloroethene	ND		ug/kg	0.50	--

Project Name: LEDGE RD LANDFILL **Lab Number:** L2403791

Project Number: 289302 **Report Date:** 01/25/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 01/24/24 19:34
Analyst: SLS

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1878014-5					
1,2-Dichlorobenzene	ND		ug/kg	2.0	--
1,3-Dichlorobenzene	ND		ug/kg	2.0	--
1,4-Dichlorobenzene	ND		ug/kg	2.0	--
Methyl tert butyl ether	ND		ug/kg	2.0	--
p/m-Xylene	ND		ug/kg	2.0	--
o-Xylene	ND		ug/kg	1.0	--
Xylenes, Total	ND		ug/kg	1.0	--
cis-1,2-Dichloroethene	ND		ug/kg	1.0	--
1,2-Dichloroethene, Total	ND		ug/kg	1.0	--
Dibromomethane	ND		ug/kg	2.0	--
1,2,3-Trichloropropane	ND		ug/kg	2.0	--
Styrene	ND		ug/kg	1.0	--
Dichlorodifluoromethane	ND		ug/kg	10	--
Acetone	ND		ug/kg	25	--
Carbon disulfide	ND		ug/kg	10	--
Methyl ethyl ketone	ND		ug/kg	10	--
Methyl isobutyl ketone	ND		ug/kg	10	--
2-Hexanone	ND		ug/kg	10	--
Bromochloromethane	ND		ug/kg	2.0	--
Tetrahydrofuran	ND		ug/kg	4.0	--
2,2-Dichloropropane	ND		ug/kg	2.0	--
1,2-Dibromoethane	ND		ug/kg	1.0	--
1,3-Dichloropropane	ND		ug/kg	2.0	--
1,1,1,2-Tetrachloroethane	ND		ug/kg	0.50	--
Bromobenzene	ND		ug/kg	2.0	--
n-Butylbenzene	ND		ug/kg	1.0	--
sec-Butylbenzene	ND		ug/kg	1.0	--
tert-Butylbenzene	ND		ug/kg	2.0	--
o-Chlorotoluene	ND		ug/kg	2.0	--

Project Name: LEDGE RD LANDFILL **Lab Number:** L2403791

Project Number: 289302 **Report Date:** 01/25/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 01/24/24 19:34
Analyst: SLS

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1878014-5					
p-Chlorotoluene	ND		ug/kg	2.0	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	3.0	--
Hexachlorobutadiene	ND		ug/kg	4.0	--
Isopropylbenzene	ND		ug/kg	1.0	--
p-Isopropyltoluene	ND		ug/kg	1.0	--
Naphthalene	ND		ug/kg	4.0	--
n-Propylbenzene	ND		ug/kg	1.0	--
1,2,3-Trichlorobenzene	ND		ug/kg	2.0	--
1,2,4-Trichlorobenzene	ND		ug/kg	2.0	--
1,3,5-Trimethylbenzene	ND		ug/kg	2.0	--
1,2,4-Trimethylbenzene	ND		ug/kg	2.0	--
Diethyl ether	ND		ug/kg	2.0	--
Diisopropyl Ether	ND		ug/kg	2.0	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	2.0	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	2.0	--
1,4-Dioxane	ND		ug/kg	80	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	118		70-130
Toluene-d8	102		70-130
4-Bromofluorobenzene	95		70-130
Dibromofluoromethane	109		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2403791
Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 02 Batch: WG1877777-3 WG1877777-4								
Methylene chloride	86		81		70-130	6		20
1,1-Dichloroethane	92		87		70-130	6		20
Chloroform	87		83		70-130	5		20
Carbon tetrachloride	90		88		70-130	2		20
1,2-Dichloropropane	94		90		70-130	4		20
Dibromochloromethane	86		87		70-130	1		20
1,1,2-Trichloroethane	88		86		70-130	2		20
Tetrachloroethene	91		88		70-130	3		20
Chlorobenzene	91		87		70-130	4		20
Trichlorofluoromethane	82		78		70-130	5		20
1,2-Dichloroethane	88		86		70-130	2		20
1,1,1-Trichloroethane	91		88		70-130	3		20
Bromodichloromethane	89		89		70-130	0		20
trans-1,3-Dichloropropene	86		86		70-130	0		20
cis-1,3-Dichloropropene	89		89		70-130	0		20
1,1-Dichloropropene	94		90		70-130	4		20
Bromoform	76		80		70-130	5		20
1,1,2,2-Tetrachloroethane	81		84		70-130	4		20
Benzene	92		88		70-130	4		20
Toluene	90		85		70-130	6		20
Ethylbenzene	94		89		70-130	5		20
Chloromethane	99		90		70-130	10		20
Bromomethane	93		87		70-130	7		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2403791
Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 02 Batch: WG1877777-3 WG1877777-4								
Vinyl chloride	89		83		70-130	7		20
Chloroethane	96		92		70-130	4		20
1,1-Dichloroethene	84		79		70-130	6		20
trans-1,2-Dichloroethene	86		80		70-130	7		20
Trichloroethene	94		91		70-130	3		20
1,2-Dichlorobenzene	87		84		70-130	4		20
1,3-Dichlorobenzene	88		86		70-130	2		20
1,4-Dichlorobenzene	88		85		70-130	3		20
Methyl tert butyl ether	86		86		70-130	0		20
p/m-Xylene	93		89		70-130	4		20
o-Xylene	92		88		70-130	4		20
cis-1,2-Dichloroethene	84		81		70-130	4		20
Dibromomethane	79		80		70-130	1		20
1,2,3-Trichloropropane	79		80		70-130	1		20
Styrene	94		90		70-130	4		20
Dichlorodifluoromethane	**61**	Q	**56**	Q	70-130	9		20
Acetone	**63**	Q	**64**	Q	70-130	2		20
Carbon disulfide	86		84		70-130	2		20
Methyl ethyl ketone	70		71		70-130	1		20
Methyl isobutyl ketone	74		79		70-130	7		20
2-Hexanone	75		80		70-130	6		20
Bromochloromethane	79		78		70-130	1		20
Tetrahydrofuran	70		72		70-130	3		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2403791
Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 02 Batch: WG1877777-3 WG1877777-4								
2,2-Dichloropropane	85		84		70-130	1		20
1,2-Dibromoethane	85		87		70-130	2		20
1,3-Dichloropropane	87		86		70-130	1		20
1,1,1,2-Tetrachloroethane	81		80		70-130	1		20
Bromobenzene	85		83		70-130	2		20
n-Butylbenzene	100		96		70-130	4		20
sec-Butylbenzene	95		91		70-130	4		20
tert-Butylbenzene	92		88		70-130	4		20
o-Chlorotoluene	105		102		70-130	3		20
p-Chlorotoluene	92		90		70-130	2		20
1,2-Dibromo-3-chloropropane	70		74		70-130	6		20
Hexachlorobutadiene	84		82		70-130	2		20
Isopropylbenzene	94		90		70-130	4		20
p-Isopropyltoluene	96		92		70-130	4		20
Naphthalene	80		83		70-130	4		20
n-Propylbenzene	97		92		70-130	5		20
1,2,3-Trichlorobenzene	86		86		70-130	0		20
1,2,4-Trichlorobenzene	91		91		70-130	0		20
1,3,5-Trimethylbenzene	94		89		70-130	5		20
1,2,4-Trimethylbenzene	93		91		70-130	2		20
Diethyl ether	86		83		70-130	4		20
Diisopropyl Ether	104		99		70-130	5		20
Ethyl-Tert-Butyl-Ether	93		91		70-130	2		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2403791
Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 02 Batch: WG1877777-3 WG1877777-4								
Tertiary-Amyl Methyl Ether	81		82		70-130	1		20
1,4-Dioxane	**61**	Q	**65**	Q	70-130	6		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	102		104		70-130
Toluene-d8	104		103		70-130
4-Bromofluorobenzene	101		100		70-130
Dibromofluoromethane	96		97		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2403791
Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1878014-3 WG1878014-4								
Methylene chloride	89		88		70-130	1		20
1,1-Dichloroethane	97		93		70-130	4		20
Chloroform	91		88		70-130	3		20
Carbon tetrachloride	96		93		70-130	3		20
1,2-Dichloropropane	98		96		70-130	2		20
Dibromochloromethane	91		91		70-130	0		20
1,1,2-Trichloroethane	90		89		70-130	1		20
Tetrachloroethene	95		91		70-130	4		20
Chlorobenzene	95		91		70-130	4		20
Trichlorofluoromethane	93		89		70-130	4		20
1,2-Dichloroethane	91		91		70-130	0		20
1,1,1-Trichloroethane	96		92		70-130	4		20
Bromodichloromethane	94		94		70-130	0		20
trans-1,3-Dichloropropene	88		87		70-130	1		20
cis-1,3-Dichloropropene	92		92		70-130	0		20
1,1-Dichloropropene	99		93		70-130	6		20
Bromoform	79		83		70-130	5		20
1,1,2,2-Tetrachloroethane	83		86		70-130	4		20
Benzene	96		93		70-130	3		20
Toluene	95		91		70-130	4		20
Ethylbenzene	98		94		70-130	4		20
Chloromethane	110		104		70-130	6		20
Bromomethane	98		93		70-130	5		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2403791
Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1878014-3 WG1878014-4								
Vinyl chloride	99		91		70-130	8		20
Chloroethane	104		98		70-130	6		20
1,1-Dichloroethene	92		85		70-130	8		20
trans-1,2-Dichloroethene	90		87		70-130	3		20
Trichloroethene	100		95		70-130	5		20
1,2-Dichlorobenzene	89		88		70-130	1		20
1,3-Dichlorobenzene	92		90		70-130	2		20
1,4-Dichlorobenzene	90		89		70-130	1		20
Methyl tert butyl ether	85		86		70-130	1		20
p/m-Xylene	98		94		70-130	4		20
o-Xylene	97		93		70-130	4		20
cis-1,2-Dichloroethene	89		84		70-130	6		20
Dibromomethane	82		82		70-130	0		20
1,2,3-Trichloropropane	80		82		70-130	2		20
Styrene	98		95		70-130	3		20
Dichlorodifluoromethane	76		70		70-130	8		20
Acetone	73		74		70-130	1		20
Carbon disulfide	91		89		70-130	2		20
Methyl ethyl ketone	75		80		70-130	6		20
Methyl isobutyl ketone	74		78		70-130	5		20
2-Hexanone	78		80		70-130	3		20
Bromochloromethane	81		82		70-130	1		20
Tetrahydrofuran	75		75		70-130	0		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2403791
Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1878014-3 WG1878014-4								
2,2-Dichloropropane	87		86		70-130	1		20
1,2-Dibromoethane	86		87		70-130	1		20
1,3-Dichloropropane	90		90		70-130	0		20
1,1,1,2-Tetrachloroethane	84		84		70-130	0		20
Bromobenzene	86		85		70-130	1		20
n-Butylbenzene	106		102		70-130	4		20
sec-Butylbenzene	101		97		70-130	4		20
tert-Butylbenzene	97		92		70-130	5		20
o-Chlorotoluene	96		87		70-130	10		20
p-Chlorotoluene	97		94		70-130	3		20
1,2-Dibromo-3-chloropropane	**68**	Q	74		70-130	8		20
Hexachlorobutadiene	86		85		70-130	1		20
Isopropylbenzene	97		95		70-130	2		20
p-Isopropyltoluene	99		96		70-130	3		20
Naphthalene	78		79		70-130	1		20
n-Propylbenzene	100		97		70-130	3		20
1,2,3-Trichlorobenzene	87		87		70-130	0		20
1,2,4-Trichlorobenzene	92		91		70-130	1		20
1,3,5-Trimethylbenzene	97		95		70-130	2		20
1,2,4-Trimethylbenzene	97		94		70-130	3		20
Diethyl ether	89		89		70-130	0		20
Diisopropyl Ether	111		107		70-130	4		20
Ethyl-Tert-Butyl-Ether	93		92		70-130	1		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2403791
Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab	Associated sample(s): 01		Batch: WG1878014-3 WG1878014-4					
Tertiary-Amyl Methyl Ether	79		79		70-130	0		20
1,4-Dioxane	**60**	Q	**62**	Q	70-130	3		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	102		105		70-130
Toluene-d8	107		105		70-130
4-Bromofluorobenzene	100		101		70-130
Dibromofluoromethane	99		101		70-130

SEMIVOLATILES

Project Name: LEDGE RD LANDFILL
Lab Number: L2403791
Project Number: 289302
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-01
Client ID: WRA-1-S
Sample Location: ANDOVER, MA

Date Collected: 01/22/24 11:30
Date Received: 01/23/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8270E
Analytical Date: 01/24/24 14:27
Analyst: IM
Percent Solids: 54%

Extraction Method: EPA 3546
Extraction Date: 01/23/24 21:55

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP PAHs - Westborough Lab						
Acenaphthene	ND		ug/kg	240	--	1
Fluoranthene	600		ug/kg	180	--	1
Naphthalene	ND		ug/kg	300	--	1
Benzo(a)anthracene	390		ug/kg	180	--	1
Benzo(a)pyrene	410		ug/kg	240	--	1
Benzo(b)fluoranthene	480		ug/kg	180	--	1
Benzo(k)fluoranthene	180		ug/kg	180	--	1
Chrysene	390		ug/kg	180	--	1
Acenaphthylene	ND		ug/kg	240	--	1
Anthracene	ND		ug/kg	180	--	1
Benzo(ghi)perylene	ND		ug/kg	240	--	1
Fluorene	ND		ug/kg	300	--	1
Phenanthrene	400		ug/kg	180	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	130	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	240	--	1
Pyrene	650		ug/kg	180	--	1
2-Methylnaphthalene	ND		ug/kg	130	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	59		30-130
2-Fluorobiphenyl	65		30-130
4-Terphenyl-d14	62		30-130

Project Name: LEDGE RD LANDFILL
Lab Number: L2403791
Project Number: 289302
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-02
Client ID: WRA-1-N
Sample Location: ANDOVER, MA

Date Collected: 01/23/24 08:00
Date Received: 01/23/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8270E
Analytical Date: 01/24/24 14:44
Analyst: IM
Percent Solids: 72%

Extraction Method: EPA 3546
Extraction Date: 01/23/24 21:55

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP PAHs - Westborough Lab						
Acenaphthene	ND		ug/kg	180	--	1
Fluoranthene	ND		ug/kg	140	--	1
Naphthalene	ND		ug/kg	230	--	1
Benzo(a)anthracene	ND		ug/kg	140	--	1
Benzo(a)pyrene	ND		ug/kg	180	--	1
Benzo(b)fluoranthene	ND		ug/kg	140	--	1
Benzo(k)fluoranthene	ND		ug/kg	140	--	1
Chrysene	ND		ug/kg	140	--	1
Acenaphthylene	ND		ug/kg	180	--	1
Anthracene	ND		ug/kg	140	--	1
Benzo(ghi)perylene	ND		ug/kg	180	--	1
Fluorene	ND		ug/kg	230	--	1
Phenanthrene	ND		ug/kg	140	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	97	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	180	--	1
Pyrene	140		ug/kg	140	--	1
2-Methylnaphthalene	ND		ug/kg	97	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	71		30-130
2-Fluorobiphenyl	75		30-130
4-Terphenyl-d14	74		30-130

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2403791
Report Date: 01/25/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E
Analytical Date: 01/24/24 09:25
Analyst: IM

Extraction Method: EPA 3546
Extraction Date: 01/23/24 21:55

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-02 Batch: WG1877486-1					
Acenaphthene	ND		ug/kg	130	--
Fluoranthene	ND		ug/kg	98	--
Naphthalene	ND		ug/kg	160	--
Benzo(a)anthracene	ND		ug/kg	98	--
Benzo(a)pyrene	ND		ug/kg	130	--
Benzo(b)fluoranthene	ND		ug/kg	98	--
Benzo(k)fluoranthene	ND		ug/kg	98	--
Chrysene	ND		ug/kg	98	--
Acenaphthylene	ND		ug/kg	130	--
Anthracene	ND		ug/kg	98	--
Benzo(ghi)perylene	ND		ug/kg	130	--
Fluorene	ND		ug/kg	160	--
Phenanthrene	ND		ug/kg	98	--
Dibenzo(a,h)anthracene	ND		ug/kg	68	--
Indeno(1,2,3-cd)pyrene	ND		ug/kg	130	--
Pyrene	ND		ug/kg	98	--
2-Methylnaphthalene	ND		ug/kg	68	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	50		30-130
2-Fluorobiphenyl	53		30-130
4-Terphenyl-d14	74		30-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2403791

Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG1877486-2 WG1877486-3								
Acenaphthene	58		61		40-140	5		30
Fluoranthene	70		73		40-140	4		30
Naphthalene	56		63		40-140	12		30
Benzo(a)anthracene	67		69		40-140	3		30
Benzo(a)pyrene	75		79		40-140	5		30
Benzo(b)fluoranthene	68		71		40-140	4		30
Benzo(k)fluoranthene	69		71		40-140	3		30
Chrysene	66		69		40-140	4		30
Acenaphthylene	63		69		40-140	9		30
Anthracene	66		70		40-140	6		30
Benzo(ghi)perylene	60		62		40-140	3		30
Fluorene	61		66		40-140	8		30
Phenanthrene	64		66		40-140	3		30
Dibenzo(a,h)anthracene	61		63		40-140	3		30
Indeno(1,2,3-cd)pyrene	62		63		40-140	2		30
Pyrene	70		74		40-140	6		30
2-Methylnaphthalene	61		68		40-140	11		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2403791
Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG1877486-2 WG1877486-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Nitrobenzene-d5	56		63		30-130
2-Fluorobiphenyl	63		67		30-130
4-Terphenyl-d14	74		77		30-130

Matrix Spike Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2403791
Report Date: 01/25/24

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1877486-4 QC Sample: L2403791-02 Client ID: WRA-1-N												
Acenaphthene	ND	1820	970	53		-	-		40-140	-		30
Fluoranthene	ND	1820	1200	66		-	-		40-140	-		30
Naphthalene	ND	1820	1100	60		-	-		40-140	-		30
Benzo(a)anthracene	ND	1820	1100	60		-	-		40-140	-		30
Benzo(a)pyrene	ND	1820	1200	66		-	-		40-140	-		30
Benzo(b)fluoranthene	ND	1820	1100	60		-	-		40-140	-		30
Benzo(k)fluoranthene	ND	1820	1000	55		-	-		40-140	-		30
Chrysene	ND	1820	1100	60		-	-		40-140	-		30
Acenaphthylene	ND	1820	1200	66		-	-		40-140	-		30
Anthracene	ND	1820	1100	60		-	-		40-140	-		30
Benzo(ghi)perylene	ND	1820	940	52		-	-		40-140	-		30
Fluorene	ND	1820	1000	55		-	-		40-140	-		30
Phenanthrene	ND	1820	1100	60		-	-		40-140	-		30
Dibenzo(a,h)anthracene	ND	1820	920	50		-	-		40-140	-		30
Indeno(1,2,3-cd)pyrene	ND	1820	980	54		-	-		40-140	-		30
Pyrene	140	1820	1300	71		-	-		40-140	-		30
2-Methylnaphthalene	ND	1820	1100	60		-	-		40-140	-		30

Surrogate	MS % Recovery	MS Qualifier	MSD % Recovery	MSD Qualifier	Acceptance Criteria
2-Fluorobiphenyl	58				30-130
4-Terphenyl-d14	51				30-130
Nitrobenzene-d5	58				30-130

Lab Duplicate Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2403791
Report Date: 01/25/24

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
MCP PAHs - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1877486-5 QC Sample: L2403791-02 Client ID: WRA-1-N						
Acenaphthene	ND	ND	ug/kg	NC		30
Fluoranthene	ND	250	ug/kg	NC		30
Naphthalene	ND	ND	ug/kg	NC		30
Benzo(a)anthracene	ND	190	ug/kg	NC		30
Benzo(a)pyrene	ND	190	ug/kg	NC		30
Benzo(b)fluoranthene	ND	210	ug/kg	NC		30
Benzo(k)fluoranthene	ND	ND	ug/kg	NC		30
Chrysene	ND	180	ug/kg	NC		30
Acenaphthylene	ND	ND	ug/kg	NC		30
Anthracene	ND	ND	ug/kg	NC		30
Benzo(ghi)perylene	ND	ND	ug/kg	NC		30
Fluorene	ND	ND	ug/kg	NC		30
Phenanthrene	ND	140	ug/kg	NC		30
Dibenzo(a,h)anthracene	ND	ND	ug/kg	NC		30
Indeno(1,2,3-cd)pyrene	ND	ND	ug/kg	NC		30
Pyrene	140	340	ug/kg	**83**	Q	30
2-Methylnaphthalene	ND	ND	ug/kg	NC		30

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	71		71		30-130
2-Fluorobiphenyl	75		71		30-130

Lab Duplicate Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2403791
Report Date: 01/25/24

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
MCP PAHs - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1877486-5 QC Sample: L2403791-02 Client ID: WRA-1-N						

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
4-Terphenyl-d14	74		60		30-130

PETROLEUM HYDROCARBONS

Project Name: LEDGE RD LANDFILL
Lab Number: L2403791
Project Number: 289302
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-01
Client ID: WRA-1-S
Sample Location: ANDOVER, MA

Date Collected: 01/22/24 11:30
Date Received: 01/23/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 1,8015D(M)
Analytical Date: 01/24/24 08:32
Analyst: LMR
Percent Solids: 54%

Extraction Method: EPA 3546
Extraction Date: 01/24/24 00:05

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C10-C36)	236000		ug/kg	59400	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	69		40-140

Project Name: LEDGE RD LANDFILL
Lab Number: L2403791
Project Number: 289302
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-02
Client ID: WRA-1-N
Sample Location: ANDOVER, MA

Date Collected: 01/23/24 08:00
Date Received: 01/23/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 1,8015D(M)
Analytical Date: 01/24/24 08:07
Analyst: LMR
Percent Solids: 72%

Extraction Method: EPA 3546
Extraction Date: 01/24/24 00:05

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C10-C36)	ND		ug/kg	44600	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	63		40-140

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2403791
Report Date: 01/25/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015D(M)
Analytical Date: 01/24/24 08:32
Analyst: LMR

Extraction Method: EPA 3546
Extraction Date: 01/24/24 00:05

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbon Quantitation - Westborough Lab for sample(s): 01-02 Batch: WG1877501-1					
TPH (C10-C36)	ND		ug/kg	31800	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	65		40-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2403791

Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 01-02 Batch: WG1877501-2								
TPH (C10-C36)	94		-		40-140	-		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
o-Terphenyl	84				40-140

Lab Duplicate Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2403791
Report Date: 01/25/24

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG1877501-3 QC Sample: L2403791-01 Client ID: WRA-1-S						
TPH (C10-C36)	236000	180000	ug/kg	27		40

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	69		84		40-140

PCBS

Project Name: LEDGE RD LANDFILL
Lab Number: L2403791
Project Number: 289302
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-01
Client ID: WRA-1-S
Sample Location: ANDOVER, MA

Date Collected: 01/22/24 11:30
Date Received: 01/23/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8082A
Analytical Date: 01/24/24 08:56
Analyst: MEO
Percent Solids: 54%

Extraction Method: EPA 3546
Extraction Date: 01/23/24 23:52
Cleanup Method: EPA 3665A
Cleanup Date: 01/24/24
Cleanup Method: EPA 3660B
Cleanup Date: 01/24/24

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	92.5	--	1	A
Aroclor 1221	ND		ug/kg	92.5	--	1	A
Aroclor 1232	ND		ug/kg	92.5	--	1	A
Aroclor 1242	ND		ug/kg	92.5	--	1	A
Aroclor 1248	ND		ug/kg	92.5	--	1	A
Aroclor 1254	ND		ug/kg	92.5	--	1	A
Aroclor 1260	ND		ug/kg	92.5	--	1	A
Aroclor 1262	ND		ug/kg	92.5	--	1	A
Aroclor 1268	ND		ug/kg	92.5	--	1	A
PCBs, Total	ND		ug/kg	92.5	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	62		30-150	A
Decachlorobiphenyl	82		30-150	A
2,4,5,6-Tetrachloro-m-xylene	74		30-150	B
Decachlorobiphenyl	78		30-150	B

Project Name: LEDGE RD LANDFILL
Lab Number: L2403791
Project Number: 289302
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-02
Client ID: WRA-1-N
Sample Location: ANDOVER, MA

Date Collected: 01/23/24 08:00
Date Received: 01/23/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8082A
Analytical Date: 01/24/24 09:06
Analyst: MEO
Percent Solids: 72%

Extraction Method: EPA 3546
Extraction Date: 01/23/24 23:52
Cleanup Method: EPA 3665A
Cleanup Date: 01/24/24
Cleanup Method: EPA 3660B
Cleanup Date: 01/24/24

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	67.2	--	1	A
Aroclor 1221	ND		ug/kg	67.2	--	1	A
Aroclor 1232	ND		ug/kg	67.2	--	1	A
Aroclor 1242	ND		ug/kg	67.2	--	1	A
Aroclor 1248	ND		ug/kg	67.2	--	1	B
Aroclor 1254	ND		ug/kg	67.2	--	1	B
Aroclor 1260	ND		ug/kg	67.2	--	1	A
Aroclor 1262	ND		ug/kg	67.2	--	1	A
Aroclor 1268	ND		ug/kg	67.2	--	1	A
PCBs, Total	ND		ug/kg	67.2	--	1	B

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	67		30-150	A
Decachlorobiphenyl	81		30-150	A
2,4,5,6-Tetrachloro-m-xylene	74		30-150	B
Decachlorobiphenyl	75		30-150	B

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2403791
Report Date: 01/25/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082A
Analytical Date: 01/24/24 08:26
Analyst: MEO

Extraction Method: EPA 3546
Extraction Date: 01/23/24 23:52
Cleanup Method: EPA 3665A
Cleanup Date: 01/24/24
Cleanup Method: EPA 3660B
Cleanup Date: 01/24/24

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01-02 Batch: WG1877500-1						
Aroclor 1016	ND		ug/kg	48.7	--	A
Aroclor 1221	ND		ug/kg	48.7	--	A
Aroclor 1232	ND		ug/kg	48.7	--	A
Aroclor 1242	ND		ug/kg	48.7	--	A
Aroclor 1248	ND		ug/kg	48.7	--	A
Aroclor 1254	ND		ug/kg	48.7	--	A
Aroclor 1260	ND		ug/kg	48.7	--	A
Aroclor 1262	ND		ug/kg	48.7	--	A
Aroclor 1268	ND		ug/kg	48.7	--	A
PCBs, Total	ND		ug/kg	48.7	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	75		30-150	A
Decachlorobiphenyl	87		30-150	A
2,4,5,6-Tetrachloro-m-xylene	84		30-150	B
Decachlorobiphenyl	79		30-150	B

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2403791
Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01-02 Batch: WG1877500-2 WG1877500-3									
Aroclor 1016	74		69		40-140	7		30	A
Aroclor 1260	78		73		40-140	7		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	79		72		30-150	A
Decachlorobiphenyl	90		83		30-150	A
2,4,5,6-Tetrachloro-m-xylene	88		80		30-150	B
Decachlorobiphenyl	81		73		30-150	B

METALS

Project Name: LEDGE RD LANDFILL
Lab Number: L2403791
Project Number: 289302
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-01
Client ID: WRA-1-S
Sample Location: ANDOVER, MA
Date Collected: 01/22/24 11:30
Date Received: 01/23/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 54%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	26.6		mg/kg	3.63	--	1	01/24/24 07:25	01/24/24 09:50	EPA 3050B	97,6010D	DHL
Arsenic, Total	16.5		mg/kg	0.727	--	1	01/24/24 07:25	01/24/24 09:50	EPA 3050B	97,6010D	DHL
Barium, Total	496		mg/kg	0.727	--	1	01/24/24 07:25	01/24/24 09:50	EPA 3050B	97,6010D	DHL
Beryllium, Total	0.444		mg/kg	0.363	--	1	01/24/24 07:25	01/24/24 09:50	EPA 3050B	97,6010D	DHL
Cadmium, Total	3.34		mg/kg	0.727	--	1	01/24/24 07:25	01/24/24 09:50	EPA 3050B	97,6010D	DHL
Chromium, Total	23.6		mg/kg	0.727	--	1	01/24/24 07:25	01/24/24 09:50	EPA 3050B	97,6010D	DHL
Lead, Total	798		mg/kg	3.63	--	1	01/24/24 07:25	01/24/24 09:50	EPA 3050B	97,6010D	DHL
Mercury, Total	ND		mg/kg	0.142	--	1	01/24/24 07:55	01/24/24 10:31	EPA 7471B	97,7471B	GMG
Nickel, Total	22.1		mg/kg	1.82	--	1	01/24/24 07:25	01/24/24 09:50	EPA 3050B	97,6010D	DHL
Selenium, Total	ND		mg/kg	3.63	--	1	01/24/24 07:25	01/24/24 09:50	EPA 3050B	97,6010D	DHL
Silver, Total	0.872		mg/kg	0.727	--	1	01/24/24 07:25	01/24/24 09:50	EPA 3050B	97,6010D	DHL
Thallium, Total	ND		mg/kg	3.63	--	1	01/24/24 07:25	01/24/24 09:50	EPA 3050B	97,6010D	DHL
Vanadium, Total	27.1		mg/kg	0.727	--	1	01/24/24 07:25	01/24/24 09:50	EPA 3050B	97,6010D	DHL
Zinc, Total	3040		mg/kg	36.3	--	10	01/24/24 07:25	01/24/24 12:19	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2403791
Project Number: 289302
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-02
Client ID: WRA-1-N
Sample Location: ANDOVER, MA
Date Collected: 01/23/24 08:00
Date Received: 01/23/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 72%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	4.05		mg/kg	2.73	--	1	01/24/24 07:25	01/24/24 09:53	EPA 3050B	97,6010D	DHL
Arsenic, Total	9.07		mg/kg	0.545	--	1	01/24/24 07:25	01/24/24 09:53	EPA 3050B	97,6010D	DHL
Barium, Total	72.7		mg/kg	0.545	--	1	01/24/24 07:25	01/24/24 09:53	EPA 3050B	97,6010D	DHL
Beryllium, Total	0.311		mg/kg	0.273	--	1	01/24/24 07:25	01/24/24 09:53	EPA 3050B	97,6010D	DHL
Cadmium, Total	3.63		mg/kg	0.545	--	1	01/24/24 07:25	01/24/24 09:53	EPA 3050B	97,6010D	DHL
Chromium, Total	18.8		mg/kg	0.545	--	1	01/24/24 07:25	01/24/24 09:53	EPA 3050B	97,6010D	DHL
Lead, Total	96.3		mg/kg	2.73	--	1	01/24/24 07:25	01/24/24 09:53	EPA 3050B	97,6010D	DHL
Mercury, Total	ND		mg/kg	0.095	--	1	01/24/24 07:55	01/24/24 10:34	EPA 7471B	97,7471B	GMG
Nickel, Total	15.0		mg/kg	1.36	--	1	01/24/24 07:25	01/24/24 09:53	EPA 3050B	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.73	--	1	01/24/24 07:25	01/24/24 09:53	EPA 3050B	97,6010D	DHL
Silver, Total	ND		mg/kg	0.545	--	1	01/24/24 07:25	01/24/24 09:53	EPA 3050B	97,6010D	DHL
Thallium, Total	ND		mg/kg	2.73	--	1	01/24/24 07:25	01/24/24 09:53	EPA 3050B	97,6010D	DHL
Vanadium, Total	12.9		mg/kg	0.545	--	1	01/24/24 07:25	01/24/24 09:53	EPA 3050B	97,6010D	DHL
Zinc, Total	1390		mg/kg	27.3	--	10	01/24/24 07:25	01/24/24 12:22	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL **Lab Number:** L2403791

Project Number: 289302 **Report Date:** 01/25/24

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-02 Batch: WG1877548-1										
Mercury, Total	ND		mg/kg	0.083	--	1	01/24/24 07:55	01/24/24 10:01	97,7471B	GMG

Prep Information

Digestion Method: EPA 7471B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-02 Batch: WG1877549-1										
Antimony, Total	ND		mg/kg	2.00	--	1	01/24/24 07:25	01/24/24 09:27	97,6010D	DHL
Arsenic, Total	ND		mg/kg	0.400	--	1	01/24/24 07:25	01/24/24 09:27	97,6010D	DHL
Barium, Total	ND		mg/kg	0.400	--	1	01/24/24 07:25	01/24/24 09:27	97,6010D	DHL
Beryllium, Total	ND		mg/kg	0.200	--	1	01/24/24 07:25	01/24/24 09:27	97,6010D	DHL
Cadmium, Total	ND		mg/kg	0.400	--	1	01/24/24 07:25	01/24/24 09:27	97,6010D	DHL
Chromium, Total	ND		mg/kg	0.400	--	1	01/24/24 07:25	01/24/24 09:27	97,6010D	DHL
Lead, Total	ND		mg/kg	2.00	--	1	01/24/24 07:25	01/24/24 09:27	97,6010D	DHL
Nickel, Total	ND		mg/kg	1.00	--	1	01/24/24 07:25	01/24/24 09:27	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.00	--	1	01/24/24 07:25	01/24/24 09:27	97,6010D	DHL
Silver, Total	ND		mg/kg	0.400	--	1	01/24/24 07:25	01/24/24 09:27	97,6010D	DHL
Thallium, Total	ND		mg/kg	2.00	--	1	01/24/24 07:25	01/24/24 09:27	97,6010D	DHL
Vanadium, Total	ND		mg/kg	0.400	--	1	01/24/24 07:25	01/24/24 09:27	97,6010D	DHL
Zinc, Total	ND		mg/kg	2.00	--	1	01/24/24 07:25	01/24/24 09:27	97,6010D	DHL

Prep Information

Digestion Method: EPA 3050B

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2403791

Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1877548-2 WG1877548-3 SRM Lot Number: D122-540								
Mercury, Total	98		102		73-127	4		30
MCP Total Metals - Mansfield Lab Associated sample(s): 01-02 Batch: WG1877549-2 WG1877549-3 SRM Lot Number: D122-540								
Antimony, Total	182		171		6-194	6		30
Arsenic, Total	117		109		81-119	7		30
Barium, Total	105		101		83-117	4		30
Beryllium, Total	109		104		83-117	5		30
Cadmium, Total	107		100		83-117	7		30
Chromium, Total	108		101		82-118	7		30
Lead, Total	115		108		83-117	6		30
Nickel, Total	109		101		83-117	8		30
Selenium, Total	117		108		81-119	8		30
Silver, Total	112		105		80-120	6		30
Thallium, Total	116		110		81-119	5		30
Vanadium, Total	105		99		80-120	6		30
Zinc, Total	108		98		82-119	10		30

INORGANICS
&
MISCELLANEOUS

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2403791
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-01
Client ID: WRA-1-S
Sample Location: ANDOVER, MA

Date Collected: 01/22/24 11:30
Date Received: 01/23/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	53.7		%	0.100	NA	1	-	01/23/24 23:24	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2403791
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2403791-02
Client ID: WRA-1-N
Sample Location: ANDOVER, MA

Date Collected: 01/23/24 08:00
Date Received: 01/23/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	71.9		%	0.100	NA	1	-	01/23/24 23:24	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2403791
Report Date: 01/25/24

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2403791-01A	Vial MeOH preserved	A	NA		3.6	Y	Absent		MCP-8260HLW-21(14)
L2403791-01B	Vial water preserved	A	NA		3.6	Y	Absent	23-JAN-24 21:02	MCP-8260HLW-21(14)
L2403791-01C	Vial water preserved	A	NA		3.6	Y	Absent	23-JAN-24 21:02	MCP-8260HLW-21(14)
L2403791-01D	Plastic 2oz unpreserved for TS	A	NA		3.6	Y	Absent		TS(7)
L2403791-01E	Metals Only-Glass 60mL/2oz unpreserved	A	NA		3.6	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-CD-6010T-10(180),MCP-7471T-10(28),MCP-TL-6010T-10(180),MCP-ZN-6010T-10(180),MCP-SB-6010T-10(180),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L2403791-01F	Glass 250ml/8oz unpreserved	A	NA		3.6	Y	Absent		MCP-8082-10(365),MCP-PAH-21(14),TPH-DRO-D(14)
L2403791-02A	Vial MeOH preserved	A	NA		3.6	Y	Absent		MCP-8260HLW-21(14)
L2403791-02B	Vial water preserved	A	NA		3.6	Y	Absent	23-JAN-24 21:02	MCP-8260HLW-21(14)
L2403791-02C	Vial water preserved	A	NA		3.6	Y	Absent	23-JAN-24 21:02	MCP-8260HLW-21(14)
L2403791-02D	Plastic 2oz unpreserved for TS	A	NA		3.6	Y	Absent		TS(7)
L2403791-02E	Metals Only-Glass 60mL/2oz unpreserved	A	NA		3.6	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-CD-6010T-10(180),MCP-TL-6010T-10(180),MCP-7471T-10(28),MCP-ZN-6010T-10(180),MCP-SB-6010T-10(180),MCP-AG-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L2403791-02F	Glass 250ml/8oz unpreserved	A	NA		3.6	Y	Absent		MCP-8082-10(365),MCP-PAH-21(14),TPH-DRO-D(14)

*Values in parentheses indicate holding time in days

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2403791
Project Number:	289302	**Report Date:**	01/25/24

GLOSSARY

Acronyms

DL - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EMPC - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LOD - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

LOQ - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

NR - No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TEF - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.

TEQ - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2403791
Project Number:	289302	**Report Date:**	01/25/24

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2403791
Project Number:	289302	**Report Date:**	01/25/24

Data Qualifiers

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: Data Usability Report

Project Name: LEDGE RD LANDFILL **Lab Number:** L2403791

Project Number: 289302 **Report Date:** 01/25/24

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010 and WSC-CAM-IIIA and IIID, January 2024.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

141 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA and IIB, November 2021.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE ____ OF ____

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 1/23/24

ALPHA Job #: L2403791

Client Information

Client: CDM Smith
Address: 75 State Street, Suite 701
Boston, MA 02109
Phone: 617-452-6563
Fax:
Email: JonesNE@cdmsmith.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Ledge Rd Landfill
Project Location: Andover, MA
Project #: 289302
Project Manager: Nathan Jones
ALPHA Quote #:

Turn-Around Time

☐ Standard ☒ RUSH (only confirmed if pre-approved)
Date Due: Time:

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client Info PO #:

Regulatory Requirements/Report Limits

State /Fed Program: MassDEP Criteria: RCS-1 Soil Standards

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

☒ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☒ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

Detection limits for each parameter shall be less than reportable concentrations for RCS-1 criteria

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	ANALYSIS: VOCs - EPA 8260	MCP 14 Metals - EPA 6010/7000	PAHs - EPA 8270	TPH - MassDEP Method	PCBs - EPA 8082	SAMPLE HANDLING	TOTAL # BOTTLES
03791-01	WRA-1-MS	1/22/24	11:30	SO	ET	X	X	X	X	X		
02	WRA-1-SN	1/23/24	8:00	SO	ET	X	X	X	X	X		

SAMPLE HANDLING: Filtration ☐ Done ☒ Not needed ☐ Lab to do; Preservation ☐ Lab to do (Please specify below); Sample Specific Comments

Container Type																			
Preservative																			

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP *or* CT RCP?

Relinquished By:	Date/Time	Received By:	Date/Time
myCDMSmith	1/23/24 15:10		1/23/24 15:10
	1/23/24 19:30		1/23/24 19:30

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

Method Blank Summary
Form 4
Volatiles

Client	: CDM Smith, Inc.	**Lab Number**	: L2403791
Project Name	: LEDGE RD LANDFILL	**Project Number**	: 289302
Lab Sample ID	: WG1877777-5	**Lab File ID**	: V29240124A05
Instrument ID	: VOA129		
Matrix	: SOIL	**Analysis Date**	: 01/24/24 09:03

Client Sample No.	Lab Sample ID	Analysis Date
WG1877777-3LCS	WG1877777-3	01/24/24 07:40
WG1877777-4LCSD	WG1877777-4	01/24/24 08:01
WRA-1-N	L2403791-02	01/24/24 11:36

Method Blank Summary
Form 4
Volatiles

Client	: CDM Smith, Inc.	**Lab Number**	: L2403791
Project Name	: LEDGE RD LANDFILL	**Project Number**	: 289302
Lab Sample ID	: WG1878014-5	**Lab File ID**	: V29240124N05
Instrument ID	: VOA129		
Matrix	: SOIL	**Analysis Date**	: 01/24/24 19:34

Client Sample No.	Lab Sample ID	Analysis Date
WG1878014-3LCS	WG1878014-3	01/24/24 18:11
WG1878014-4LCSD	WG1878014-4	01/24/24 18:32
WRA-1-S	L2403791-01	01/24/24 23:43

Calibration Verification Summary
Form 7
Volatiles

Client	: CDM Smith, Inc.	**Lab Number**	: L2403791
Project Name	: LEDGE RD LANDFILL	**Project Number**	: 289302
Instrument ID	: VOA129	**Calibration Date**	: 01/24/24 07:40
Lab File ID	: V29240124A01	**Init. Calib. Date(s)**	: 12/19/23 12/20/23
Sample No	: WG1877777-2	**Init. Calib. Times**	: 21:48 01:16
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
Fluorobenzene	1	1	-	0	20	80	0
Dichlorodifluoromethane	0.332	0.202	-	39.2*	20	46	0
Chloromethane	0.42	0.418	-	0.5	20	75	0
Vinyl chloride	0.377	0.336	-	10.9	20	67	0
Bromomethane	0.185	0.171	-	7.6	20	78	0
Chloroethane	0.206	0.199	-	3.4	20	72	0
Trichlorofluoromethane	0.367	0.3	-	18.3	20	61	0
Ethyl ether	0.13	0.112	-	13.8	20	66	0
1,1-Dichloroethene	0.225	0.19	-	15.6	20	64	0
Carbon disulfide	0.786	0.68	-	13.5	20	65	0
Methylene chloride	40	34.465	-	13.8	20	66	0
Acetone	40	25.193	-	37*	20	56	0
trans-1,2-Dichloroethene	0.255	0.218	-	14.5	20	65	0
Methyl tert-butyl ether	0.671	0.578	-	13.9	20	63	0
Diisopropyl ether	1.023	1.068	-	-4.4	20	76	0
1,1-Dichloroethane	0.563	0.516	-	8.3	20	70	0
Ethyl tert-butyl ether	0.907	0.845	-	6.8	20	67	0
cis-1,2-Dichloroethene	0.289	0.243	-	15.9	20	63	0
2,2-Dichloropropane	0.35	0.298	-	14.9	20	65	0
Bromochloromethane	0.134	0.106	-	20.9*	20	61	0
Chloroform	0.485	0.423	-	12.8	20	66	0
Carbon tetrachloride	0.313	0.282	-	9.9	20	66	0
Tetrahydrofuran	0.112	0.078	-	30.4*	20	57	0
Dibromofluoromethane	0.252	0.243	-	3.6	20	77	0
1,1,1-Trichloroethane	0.381	0.348	-	8.7	20	64	0
2-Butanone	0.151	0.106	-	29.8*	20	57	0
1,1-Dichloropropene	0.343	0.324	-	5.5	20	66	0
Benzene	0.99	0.915	-	7.6	20	67	0
tert-Amyl methyl ether	0.633	0.512	-	19.1	20	59	0
1,2-Dichloroethane-d4	0.321	0.327	-	-1.9	20	83	0
1,2-Dichloroethane	0.417	0.366	-	12.2	20	66	0
Trichloroethene	0.26	0.243	-	6.5	20	66	0
Dibromomethane	0.162	0.128	-	21*	20	60	0
1,2-Dichloropropane	0.306	0.288	-	5.9	20	69	0
Bromodichloromethane	0.336	0.301	-	10.4	20	65	0
1,4-Dioxane	0.00323	0.00197*	-	39*	20	48	0
cis-1,3-Dichloropropene	0.366	0.324	-	11.5	20	61	0
Chlorobenzene-d5	1	1	-	0	20	78	0
Toluene-d8	1.302	1.36	-	-4.5	20	81	0
Toluene	0.875	0.79	-	9.7	20	66	0
4-Methyl-2-pentanone	0.155	0.115	-	25.8*	20	53	0
Tetrachloroethene	0.338	0.308	-	8.9	20	63	0
trans-1,3-Dichloropropene	0.445	0.381	-	14.4	20	61	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: CDM Smith, Inc.	**Lab Number**	: L2403791
Project Name	: LEDGE RD LANDFILL	**Project Number**	: 289302
Instrument ID	: VOA129	**Calibration Date**	: 01/24/24 07:40
Lab File ID	: V29240124A01	**Init. Calib. Date(s)**	: 12/19/23 12/20/23
Sample No	: WG1877777-2	**Init. Calib. Times**	: 21:48 01:16
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
1,1,2-Trichloroethane	0.248	0.217	-	12.5	20	63	0
Chlorodibromomethane	0.307	0.264	-	14	20	59	0
1,3-Dichloropropane	0.508	0.443	-	12.8	20	62	0
1,2-Dibromoethane	0.274	0.234	-	14.6	20	60	0
2-Hexanone	0.275	0.206	-	25.1*	20	55	0
Chlorobenzene	0.945	0.859	-	9.1	20	65	0
Ethylbenzene	1.663	1.559	-	6.3	20	68	0
1,1,1,2-Tetrachloroethane	40	32.226	-	19.4	20	62	0
p/m Xylene	0.625	0.579	-	7.4	20	66	0
o Xylene	0.606	0.559	-	7.8	20	66	0
Styrene	0.997	0.935	-	6.2	20	65	0
1,4-Dichlorobenzene-d4	1	1	-	0	20	80	0
Bromoform	0.388	0.294	-	24.2*	20	55	0
Isopropylbenzene	3.156	2.969	-	5.9	20	67	0
4-Bromofluorobenzene	0.963	0.97	-	-0.7	20	79	0
Bromobenzene	0.786	0.665	-	15.4	20	62	0
n-Propylbenzene	3.818	3.697	-	3.2	20	69	0
1,1,2,2-Tetrachloroethane	0.713	0.576	-	19.2	20	57	0
2-Chlorotoluene	2.37	2.492	-	-5.1	20	77	0
1,3,5-Trimethylbenzene	2.79	2.624	-	5.9	20	67	0
1,2,3-Trichloropropane	0.642	0.507	-	21*	20	58	0
4-Chlorotoluene	2.434	2.244	-	7.8	20	67	0
tert-Butylbenzene	2.31	2.121	-	8.2	20	66	0
1,2,4-Trimethylbenzene	2.69	2.513	-	6.6	20	67	0
sec-Butylbenzene	3.438	3.255	-	5.3	20	67	0
p-Isopropyltoluene	2.933	2.814	-	4.1	20	68	0
1,3-Dichlorobenzene	1.526	1.346	-	11.8	20	64	0
1,4-Dichlorobenzene	1.552	1.36	-	12.4	20	65	0
n-Butylbenzene	2.679	2.695	-	-0.6	20	71	0
1,2-Dichlorobenzene	1.438	1.246	-	13.4	20	64	0
1,2-Dibromo-3-chloropropan	0.115	0.08	-	30.4*	20	54	0
Hexachlorobutadiene	0.554	0.465	-	16.1	20	61	0
1,2,4-Trichlorobenzene	1.012	0.923	-	8.8	20	66	0
Naphthalene	2.453	1.972	-	19.6	20	59	0
1,2,3-Trichlorobenzene	0.973	0.839	-	13.8	20	64	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: CDM Smith, Inc.	**Lab Number**	: L2403791
Project Name	: LEDGE RD LANDFILL	**Project Number**	: 289302
Instrument ID	: VOA129	**Calibration Date**	: 01/24/24 18:11
Lab File ID	: V29240124N01	**Init. Calib. Date(s)**	: 12/19/23 12/20/23
Sample No	: WG1878014-2	**Init. Calib. Times**	: 21:48 01:16
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
Fluorobenzene	1	1	-	0	20	72	0
Dichlorodifluoromethane	0.332	0.253	-	23.8*	20	51	0
Chloromethane	0.42	0.463	-	-10.2	20	75	0
Vinyl chloride	0.377	0.374	-	0.8	20	68	0
Bromomethane	0.185	0.181	-	2.2	20	74	0
Chloroethane	0.206	0.215	-	-4.4	20	70	0
Trichlorofluoromethane	0.367	0.343	-	6.5	20	63	0
Ethyl ether	0.13	0.116	-	10.8	20	62	0
1,1-Dichloroethene	0.225	0.206	-	8.4	20	63	0
Carbon disulfide	0.786	0.718	-	8.7	20	62	0
Freon-113	0.237	0.218	-	8	20	60	0
Acrolein	40	30.425	-	23.9*	20	56	0
Methylene chloride	40	35.742	-	10.6	20	61	0
Acetone	40	29.158	-	27.1*	20	57	0
trans-1,2-Dichloroethene	0.255	0.23	-	9.8	20	62	0
Methyl acetate	0.254	0.196	-	22.8*	20	59	0
Methyl tert-butyl ether	0.671	0.572	-	14.8	20	57	-.01
tert-Butyl alcohol	0.045	0.027	-	40*	20	47	-.02
Diisopropyl ether	1.023	1.139	-	-11.3	20	73	0
1,1-Dichloroethane	0.563	0.545	-	3.2	20	67	0
Halothane	0.193	0.175	-	9.3	20	62	0
Acrylonitrile	0.108	0.084	-	22.2*	20	57	0
Ethyl tert-butyl ether	0.907	0.84	-	7.4	20	60	-.01
Vinyl acetate	0.658	0.603	-	8.4	20	62	0
cis-1,2-Dichloroethene	0.289	0.256	-	11.4	20	60	0
2,2-Dichloropropane	0.35	0.304	-	13.1	20	60	-.01
Bromochloromethane	0.134	0.109	-	18.7	20	57	0
Cyclohexane	0.555	0.579	-	-4.3	20	67	0
Chloroform	0.485	0.442	-	8.9	20	62	0
Ethyl acetate	0.302	0.248	-	17.9	20	57	0
Carbon tetrachloride	0.313	0.3	-	4.2	20	63	0
Tetrahydrofuran	0.112	0.084	-	25*	20	55	0
Dibromofluoromethane	0.252	0.25	-	0.8	20	71	0
1,1,1-Trichloroethane	0.381	0.364	-	4.5	20	61	0
2-Butanone	0.151	0.113	-	25.2*	20	55	0
1,1-Dichloropropene	0.343	0.34	-	0.9	20	63	0
Benzene	0.99	0.954	-	3.6	20	63	0
tert-Amyl methyl ether	0.633	0.5	-	21*	20	52	0
1,2-Dichloroethane-d4	0.321	0.328	-	-2.2	20	75	0
1,2-Dichloroethane	0.417	0.377	-	9.6	20	62	0
Methyl cyclohexane	0.428	0.408	-	4.7	20	61	0
Trichloroethene	0.26	0.259	-	0.4	20	63	0
Dibromomethane	0.162	0.133	-	17.9	20	57	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: CDM Smith, Inc.	**Lab Number**	: L2403791
Project Name	: LEDGE RD LANDFILL	**Project Number**	: 289302
Instrument ID	: VOA129	**Calibration Date**	: 01/24/24 18:11
Lab File ID	: V29240124N01	**Init. Calib. Date(s)**	: 12/19/23 12/20/23
Sample No	: WG1878014-2	**Init. Calib. Times**	: 21:48 01:16
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
1,2-Dichloropropane	0.306	0.3	-	2	20	65	0
2-Chloroethyl vinyl ether	0.184	0.145	-	21.2*	20	53	-.02
Bromodichloromethane	0.336	0.315	-	6.3	20	61	0
1,4-Dioxane	0.00323	0.00195*	-	39.6*	20	43	0
cis-1,3-Dichloropropene	0.366	0.335	-	8.5	20	57	0
Chlorobenzene-d5	1	1	-	0	20	70	0
Toluene-d8	1.302	1.387	-	-6.5	20	74	0
Toluene	0.875	0.832	-	4.9	20	62	0
4-Methyl-2-pentanone	0.155	0.115	-	25.8*	20	47	0
Tetrachloroethene	0.338	0.322	-	4.7	20	59	0
trans-1,3-Dichloropropene	0.445	0.39	-	12.4	20	56	0
Ethyl methacrylate	0.351	0.288	-	17.9	20	52	0
1,1,2-Trichloroethane	0.248	0.222	-	10.5	20	58	0
Chlorodibromomethane	0.307	0.28	-	8.8	20	56	0
1,3-Dichloropropane	0.508	0.454	-	10.6	20	57	0
1,2-Dibromoethane	0.274	0.237	-	13.5	20	54	0
2-Hexanone	0.275	0.215	-	21.8*	20	51	0
Chlorobenzene	0.945	0.898	-	5	20	61	0
Ethylbenzene	1.663	1.627	-	2.2	20	63	0
1,1,1,2-Tetrachloroethane	40	33.5	-	16.3	20	58	0
p/m Xylene	0.625	0.612	-	2.1	20	62	0
o Xylene	0.606	0.589	-	2.8	20	62	0
Styrene	0.997	0.978	-	1.9	20	60	0
1,4-Dichlorobenzene-d4	1	1	-	0	20	71	0
Bromoform	0.388	0.306	-	21.1*	20	52	0
Isopropylbenzene	3.156	3.071	-	2.7	20	62	0
4-Bromofluorobenzene	0.963	0.963	-	0	20	71	0
Bromobenzene	0.786	0.676	-	14	20	56	0
n-Propylbenzene	3.818	3.821	-	-0.1	20	64	0
1,4-Dichlorobutane	1.245	1.154	-	7.3	20	61	0
1,1,2,2-Tetrachloroethane	0.713	0.595	-	16.5	20	53	0
4-Ethyltoluene	3.149	3.118	-	1	20	63	0
2-Chlorotoluene	2.37	2.284	-	3.6	20	63	0
1,3,5-Trimethylbenzene	2.79	2.719	-	2.5	20	62	0
1,2,3-Trichloropropane	0.642	0.514	-	19.9	20	53	0
trans-1,4-Dichloro-2-buten	0.263	0.229	-	12.9	20	60	0
4-Chlorotoluene	2.434	2.354	-	3.3	20	63	0
tert-Butylbenzene	2.31	2.232	-	3.4	20	62	0
1,2,4-Trimethylbenzene	2.69	2.613	-	2.9	20	62	0
sec-Butylbenzene	3.438	3.466	-	-0.8	20	64	0
p-Isopropyltoluene	2.933	2.908	-	0.9	20	63	0
1,3-Dichlorobenzene	1.526	1.411	-	7.5	20	60	0
1,4-Dichlorobenzene	1.552	1.404	-	9.5	20	60	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: CDM Smith, Inc.		**Lab Number**	: L2403791	
Project Name	: LEDGE RD LANDFILL		**Project Number**	: 289302	
Instrument ID	: VOA129		**Calibration Date**	: 01/24/24 18:11	
Lab File ID	: V29240124N01		**Init. Calib. Date(s)**	: 12/19/23	12/20/23
Sample No	: WG1878014-2		**Init. Calib. Times**	: 21:48	01:16
Channel	:				

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
p-Diethylbenzene	1.805	1.785	-	1.1	20	63	0
n-Butylbenzene	2.679	2.831	-	-5.7	20	67	0
1,2-Dichlorobenzene	1.438	1.273	-	11.5	20	59	0
1,2,4,5-Tetramethylbenzene	2.739	2.644	-	3.5	20	61	0
1,2-Dibromo-3-chloropropan	0.115	0.078	-	32.2*	20	47	0
1,3,5-Trichlorobenzene	1.142	1.077	-	5.7	20	63	0
Hexachlorobutadiene	0.554	0.477	-	13.9	20	56	0
1,2,4-Trichlorobenzene	1.012	0.934	-	7.7	20	60	0
Naphthalene	2.453	1.912	-	22.1*	20	51	0
1,2,3-Trichlorobenzene	0.973	0.842	-	13.5	20	58	0

*** Value outside of QC limits.**

ANALYTICAL REPORT

Lab Number:	L2406353
Client:	CDM Smith, Inc. 75 State Street Suite 701 Boston, MA 02109
ATTN:	Nathan Jones
Phone:	(617) 452-6563
Project Name:	LEDGE RD LANDFILL
Project Number:	289302
Report Date:	02/08/24

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Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2406353-01	WRA-2	SOIL	ANDOVER, MA	02/05/24 09:55	02/06/24
L2406353-02	WRA-1-S-2	SOIL	ANDOVER, MA	02/05/24 11:35	02/06/24
L2406353-03	WRA-1-S-1	SOIL	ANDOVER, MA	02/05/24 11:45	02/06/24
L2406353-04	WRA-1-N-5	SOIL	ANDOVER, MA	02/05/24 11:55	02/06/24
L2406353-05	WRA-1-N-4	SOIL	ANDOVER, MA	02/05/24 13:10	02/06/24
L2406353-06	WRA-1-N-3	SOIL	ANDOVER, MA	02/05/24 13:45	02/06/24
L2406353-07	WRA-1-N-2	SOIL	ANDOVER, MA	02/05/24 14:10	02/06/24
L2406353-08	WRA-1-N-1	SOIL	ANDOVER, MA	02/05/24 14:20	02/06/24
L2406353-09	WRA-1-S-5	SOIL	ANDOVER, MA	02/05/24 14:45	02/06/24
L2406353-10	WRA-1-S-3	SOIL	ANDOVER, MA	02/05/24 15:40	02/06/24
L2406353-11	WRA-1-S-4	SOIL	ANDOVER, MA	02/05/24 15:50	02/06/24

Project Name: LEDGE RD LANDFILL **Lab Number:** L2406353

Project Number: 289302 **Report Date:** 02/08/24

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	NO

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2406353
Project Number:	289302	**Report Date:**	02/08/24

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: LEDGE RD LANDFILL **Lab Number:** L2406353
Project Number: 289302 **Report Date:** 02/08/24

Case Narrative (continued)

MCP Related Narratives

Sample Receipt

In reference to question H:

A Matrix Spike was not submitted for the analysis of Total Metals.

Volatile Organics

L2406353-01: Initial calibration utilized a quadratic fit for: trans-1,3-dichloropropene, chlorodibromomethane, o-xylene, styrene, bromoform

In reference to question H:

L2406353-01: Initial Calibration did not meet:

Lowest Calibration Standard Minimum Response Factor: bromochloromethane (0.0875), 1,2-dichloropropane (0.1561), bromodichloromethane (0.2539), 1,4-dioxane (0.0008), cis-1,3-dichloropropene (0.2004), 1,1,2-trichloroethane (0.1315), 1,2-dibromoethane (0.1382)

Average Response Factor: 1,2-dichloropropane, bromodichloromethane, 1,4-dioxane, cis-1,3-dichloropropene, 1,1,2-trichloroethane, 1,2-dibromoethane

Verification: tetrahydrofuran (136%), 1,4-dioxane (132%)

L2406353-01: The associated continuing calibration standard is outside the acceptance criteria for several compounds; however, it is within overall method allowances. Associated results are considered to be biased high if the %D is negative and biased low if the %D is positive. A copy of the continuing calibration standard is included as an addendum to this report.

Semivolatile Organics

In reference to question I:

All samples were analyzed for a subset of MCP analytes per client request.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Kelly O'Neill

Title: Technical Director/Representative Date: 02/08/24

QC OUTLIER SUMMARY REPORT

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment
MCP Volatile Organics by EPA 5035 Low - Westborough Lab								
8260D	Batch QC	WG1882758-3	Bromomethane	LCS	67	70-130	01	potential low bias
8260D	Batch QC	WG1882758-3	Chloroethane	LCS	67	70-130	01	potential low bias
8260D	Batch QC	WG1882758-3	Diethyl ether	LCS	69	70-130	01	potential low bias
8260D	Batch QC	WG1882758-4	Trichlorofluoromethane	LCSD	61	70-130	01	potential low bias
8260D	Batch QC	WG1882758-4	Bromomethane	LCSD	60	70-130	01	potential low bias
8260D	Batch QC	WG1882758-4	Chloroethane	LCSD	58	70-130	01	potential low bias
8260D	Batch QC	WG1882758-4	1,1-Dichloroethene	LCSD	63	70-130	01	potential low bias
8260D	Batch QC	WG1882758-4	Carbon disulfide	LCSD	62	70-130	01	potential low bias
8260D	Batch QC	WG1882758-4	Diethyl ether	LCSD	62	70-130	01	potential low bias

ORGANICS

VOLATILES

Project Name: LEDGE RD LANDFILL **Lab Number:** L2406353

Project Number: 289302 **Report Date:** 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-01 Date Collected: 02/05/24 09:55
Client ID: WRA-2 Date Received: 02/06/24
Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8260D
Analytical Date: 02/07/24 11:40
Analyst: AJK
Percent Solids: 86%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Methylene chloride	ND		ug/kg	26	--	1
1,1-Dichloroethane	ND		ug/kg	5.2	--	1
Chloroform	ND		ug/kg	7.8	--	1
Carbon tetrachloride	ND		ug/kg	5.2	--	1
1,2-Dichloropropane	ND		ug/kg	5.2	--	1
Dibromochloromethane	ND		ug/kg	5.2	--	1
1,1,2-Trichloroethane	ND		ug/kg	5.2	--	1
Tetrachloroethene	ND		ug/kg	2.6	--	1
Chlorobenzene	ND		ug/kg	2.6	--	1
Trichlorofluoromethane	ND		ug/kg	21	--	1
1,2-Dichloroethane	ND		ug/kg	5.2	--	1
1,1,1-Trichloroethane	ND		ug/kg	2.6	--	1
Bromodichloromethane	ND		ug/kg	2.6	--	1
trans-1,3-Dichloropropene	ND		ug/kg	5.2	--	1
cis-1,3-Dichloropropene	ND		ug/kg	2.6	--	1
1,3-Dichloropropene, Total	ND		ug/kg	2.6	--	1
1,1-Dichloropropene	ND		ug/kg	2.6	--	1
Bromoform	ND		ug/kg	21	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	2.6	--	1
Benzene	ND		ug/kg	2.6	--	1
Toluene	ND		ug/kg	5.2	--	1
Ethylbenzene	ND		ug/kg	5.2	--	1
Chloromethane	ND		ug/kg	21	--	1
Bromomethane	ND		ug/kg	10	--	1
Vinyl chloride	ND		ug/kg	5.2	--	1
Chloroethane	ND		ug/kg	10	--	1
1,1-Dichloroethene	ND		ug/kg	5.2	--	1
trans-1,2-Dichloroethene	ND		ug/kg	7.8	--	1

Project Name: LEDGE RD LANDFILL **Lab Number:** L2406353

Project Number: 289302 **Report Date:** 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-01 Date Collected: 02/05/24 09:55

Client ID: WRA-2 Date Received: 02/06/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Trichloroethene	ND		ug/kg	2.6	--	1
1,2-Dichlorobenzene	ND		ug/kg	10	--	1
1,3-Dichlorobenzene	ND		ug/kg	10	--	1
1,4-Dichlorobenzene	ND		ug/kg	10	--	1
Methyl tert butyl ether	ND		ug/kg	10	--	1
p/m-Xylene	ND		ug/kg	10	--	1
o-Xylene	ND		ug/kg	5.2	--	1
Xylenes, Total	ND		ug/kg	5.2	--	1
cis-1,2-Dichloroethene	ND		ug/kg	5.2	--	1
1,2-Dichloroethene, Total	ND		ug/kg	5.2	--	1
Dibromomethane	ND		ug/kg	10	--	1
1,2,3-Trichloropropane	ND		ug/kg	10	--	1
Styrene	ND		ug/kg	5.2	--	1
Dichlorodifluoromethane	ND		ug/kg	52	--	1
Acetone	ND		ug/kg	130	--	1
Carbon disulfide	ND		ug/kg	52	--	1
Methyl ethyl ketone	ND		ug/kg	52	--	1
Methyl isobutyl ketone	ND		ug/kg	52	--	1
2-Hexanone	ND		ug/kg	52	--	1
Bromochloromethane	ND		ug/kg	10	--	1
Tetrahydrofuran	ND		ug/kg	21	--	1
2,2-Dichloropropane	ND		ug/kg	10	--	1
1,2-Dibromoethane	ND		ug/kg	5.2	--	1
1,3-Dichloropropane	ND		ug/kg	10	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	2.6	--	1
Bromobenzene	ND		ug/kg	10	--	1
n-Butylbenzene	ND		ug/kg	5.2	--	1
sec-Butylbenzene	ND		ug/kg	5.2	--	1
tert-Butylbenzene	ND		ug/kg	10	--	1
o-Chlorotoluene	ND		ug/kg	10	--	1
p-Chlorotoluene	ND		ug/kg	10	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	16	--	1
Hexachlorobutadiene	ND		ug/kg	21	--	1
Isopropylbenzene	ND		ug/kg	5.2	--	1
p-Isopropyltoluene	ND		ug/kg	5.2	--	1
Naphthalene	ND		ug/kg	21	--	1
n-Propylbenzene	ND		ug/kg	5.2	--	1

Project Name: LEDGE RD LANDFILL **Lab Number:** L2406353

Project Number: 289302 **Report Date:** 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-01 Date Collected: 02/05/24 09:55

Client ID: WRA-2 Date Received: 02/06/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	10	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	10	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	10	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	10	--	1
Diethyl ether	ND		ug/kg	10	--	1
Diisopropyl Ether	ND		ug/kg	10	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	10	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	10	--	1
1,4-Dioxane	ND		ug/kg	420	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	107		70-130
Toluene-d8	94		70-130
4-Bromofluorobenzene	94		70-130
Dibromofluoromethane	117		70-130

Project Name: LEDGE RD LANDFILL **Lab Number:** L2406353

Project Number: 289302 **Report Date:** 02/08/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 02/07/24 11:14
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1882758-5					
Methylene chloride	ND		ug/kg	5.0	--
1,1-Dichloroethane	ND		ug/kg	1.0	--
Chloroform	ND		ug/kg	1.5	--
Carbon tetrachloride	ND		ug/kg	1.0	--
1,2-Dichloropropane	ND		ug/kg	1.0	--
Dibromochloromethane	ND		ug/kg	1.0	--
1,1,2-Trichloroethane	ND		ug/kg	1.0	--
Tetrachloroethene	ND		ug/kg	0.50	--
Chlorobenzene	ND		ug/kg	0.50	--
Trichlorofluoromethane	ND		ug/kg	4.0	--
1,2-Dichloroethane	ND		ug/kg	1.0	--
1,1,1-Trichloroethane	ND		ug/kg	0.50	--
Bromodichloromethane	ND		ug/kg	0.50	--
trans-1,3-Dichloropropene	ND		ug/kg	1.0	--
cis-1,3-Dichloropropene	ND		ug/kg	0.50	--
1,3-Dichloropropene, Total	ND		ug/kg	0.50	--
1,1-Dichloropropene	ND		ug/kg	0.50	--
Bromoform	ND		ug/kg	4.0	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.50	--
Benzene	ND		ug/kg	0.50	--
Toluene	ND		ug/kg	1.0	--
Ethylbenzene	ND		ug/kg	1.0	--
Chloromethane	ND		ug/kg	4.0	--
Bromomethane	ND		ug/kg	2.0	--
Vinyl chloride	ND		ug/kg	1.0	--
Chloroethane	ND		ug/kg	2.0	--
1,1-Dichloroethene	ND		ug/kg	1.0	--
trans-1,2-Dichloroethene	ND		ug/kg	1.5	--
Trichloroethene	ND		ug/kg	0.50	--

Project Name: LEDGE RD LANDFILL **Lab Number:** L2406353

Project Number: 289302 **Report Date:** 02/08/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 02/07/24 11:14
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1882758-5					
1,2-Dichlorobenzene	ND		ug/kg	2.0	--
1,3-Dichlorobenzene	ND		ug/kg	2.0	--
1,4-Dichlorobenzene	ND		ug/kg	2.0	--
Methyl tert butyl ether	ND		ug/kg	2.0	--
p/m-Xylene	ND		ug/kg	2.0	--
o-Xylene	ND		ug/kg	1.0	--
Xylenes, Total	ND		ug/kg	1.0	--
cis-1,2-Dichloroethene	ND		ug/kg	1.0	--
1,2-Dichloroethene, Total	ND		ug/kg	1.0	--
Dibromomethane	ND		ug/kg	2.0	--
1,2,3-Trichloropropane	ND		ug/kg	2.0	--
Styrene	ND		ug/kg	1.0	--
Dichlorodifluoromethane	ND		ug/kg	10	--
Acetone	ND		ug/kg	25	--
Carbon disulfide	ND		ug/kg	10	--
Methyl ethyl ketone	ND		ug/kg	10	--
Methyl isobutyl ketone	ND		ug/kg	10	--
2-Hexanone	ND		ug/kg	10	--
Bromochloromethane	ND		ug/kg	2.0	--
Tetrahydrofuran	ND		ug/kg	4.0	--
2,2-Dichloropropane	ND		ug/kg	2.0	--
1,2-Dibromoethane	ND		ug/kg	1.0	--
1,3-Dichloropropane	ND		ug/kg	2.0	--
1,1,1,2-Tetrachloroethane	ND		ug/kg	0.50	--
Bromobenzene	ND		ug/kg	2.0	--
n-Butylbenzene	ND		ug/kg	1.0	--
sec-Butylbenzene	ND		ug/kg	1.0	--
tert-Butylbenzene	ND		ug/kg	2.0	--
o-Chlorotoluene	ND		ug/kg	2.0	--

Project Name: LEDGE RD LANDFILL **Lab Number:** L2406353

Project Number: 289302 **Report Date:** 02/08/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 02/07/24 11:14
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1882758-5					
p-Chlorotoluene	ND		ug/kg	2.0	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	3.0	--
Hexachlorobutadiene	ND		ug/kg	4.0	--
Isopropylbenzene	ND		ug/kg	1.0	--
p-Isopropyltoluene	ND		ug/kg	1.0	--
Naphthalene	ND		ug/kg	4.0	--
n-Propylbenzene	ND		ug/kg	1.0	--
1,2,3-Trichlorobenzene	ND		ug/kg	2.0	--
1,2,4-Trichlorobenzene	ND		ug/kg	2.0	--
1,3,5-Trimethylbenzene	ND		ug/kg	2.0	--
1,2,4-Trimethylbenzene	ND		ug/kg	2.0	--
Diethyl ether	ND		ug/kg	2.0	--
Diisopropyl Ether	ND		ug/kg	2.0	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	2.0	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	2.0	--
1,4-Dioxane	ND		ug/kg	80	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	99		70-130
Toluene-d8	95		70-130
4-Bromofluorobenzene	97		70-130
Dibromofluoromethane	110		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2406353
Report Date: 02/08/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1882758-3 WG1882758-4								
Methylene chloride	99		96		70-130	3		20
1,1-Dichloroethane	105		99		70-130	6		20
Chloroform	110		102		70-130	8		20
Carbon tetrachloride	129		118		70-130	9		20
1,2-Dichloropropane	100		94		70-130	6		20
Dibromochloromethane	114		108		70-130	5		20
1,1,2-Trichloroethane	99		92		70-130	7		20
Tetrachloroethene	116		110		70-130	5		20
Chlorobenzene	105		99		70-130	6		20
Trichlorofluoromethane	71		**61**	Q	70-130	15		20
1,2-Dichloroethane	101		96		70-130	5		20
1,1,1-Trichloroethane	120		112		70-130	7		20
Bromodichloromethane	110		104		70-130	6		20
trans-1,3-Dichloropropene	96		91		70-130	5		20
cis-1,3-Dichloropropene	111		105		70-130	6		20
1,1-Dichloropropene	110		102		70-130	8		20
Bromoform	98		93		70-130	5		20
1,1,2,2-Tetrachloroethane	94		90		70-130	4		20
Benzene	106		100		70-130	6		20
Toluene	102		95		70-130	7		20
Ethylbenzene	101		94		70-130	7		20
Chloromethane	107		96		70-130	11		20
Bromomethane	**67**	Q	**60**	Q	70-130	11		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2406353
Report Date: 02/08/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1882758-3 WG1882758-4								
Vinyl chloride	84		75		70-130	11		20
Chloroethane	**67**	Q	**58**	Q	70-130	14		20
1,1-Dichloroethene	72		**63**	Q	70-130	13		20
trans-1,2-Dichloroethene	112		107		70-130	5		20
Trichloroethene	106		102		70-130	4		20
1,2-Dichlorobenzene	106		102		70-130	4		20
1,3-Dichlorobenzene	107		102		70-130	5		20
1,4-Dichlorobenzene	105		101		70-130	4		20
Methyl tert butyl ether	97		95		70-130	2		20
p/m-Xylene	106		99		70-130	7		20
o-Xylene	94		88		70-130	7		20
cis-1,2-Dichloroethene	106		101		70-130	5		20
Dibromomethane	104		99		70-130	5		20
1,2,3-Trichloropropane	91		85		70-130	7		20
Styrene	101		96		70-130	5		20
Dichlorodifluoromethane	91		81		70-130	12		20
Acetone	89		91		70-130	2		20
Carbon disulfide	71		**62**	Q	70-130	14		20
Methyl ethyl ketone	83		78		70-130	6		20
Methyl isobutyl ketone	75		72		70-130	4		20
2-Hexanone	76		70		70-130	8		20
Bromochloromethane	116		111		70-130	4		20
Tetrahydrofuran	88		78		70-130	12		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2406353
Report Date: 02/08/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1882758-3 WG1882758-4								
2,2-Dichloropropane	115		107		70-130	7		20
1,2-Dibromoethane	104		99		70-130	5		20
1,3-Dichloropropane	99		93		70-130	6		20
1,1,1,2-Tetrachloroethane	117		110		70-130	6		20
Bromobenzene	106		101		70-130	5		20
n-Butylbenzene	102		96		70-130	6		20
sec-Butylbenzene	101		96		70-130	5		20
tert-Butylbenzene	104		99		70-130	5		20
o-Chlorotoluene	102		98		70-130	4		20
p-Chlorotoluene	102		97		70-130	5		20
1,2-Dibromo-3-chloropropane	104		99		70-130	5		20
Hexachlorobutadiene	112		106		70-130	6		20
Isopropylbenzene	102		97		70-130	5		20
p-Isopropyltoluene	105		100		70-130	5		20
Naphthalene	96		91		70-130	5		20
n-Propylbenzene	100		95		70-130	5		20
1,2,3-Trichlorobenzene	110		105		70-130	5		20
1,2,4-Trichlorobenzene	112		106		70-130	6		20
1,3,5-Trimethylbenzene	102		97		70-130	5		20
1,2,4-Trimethylbenzene	102		97		70-130	5		20
Diethyl ether	**69**	Q	**62**	Q	70-130	11		20
Diisopropyl Ether	101		96		70-130	5		20
Ethyl-Tert-Butyl-Ether	96		91		70-130	5		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2406353

Report Date: 02/08/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1882758-3 WG1882758-4								
Tertiary-Amyl Methyl Ether	90		87		70-130	3		20
1,4-Dioxane	96		91		70-130	5		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	94		94		70-130
Toluene-d8	95		94		70-130
4-Bromofluorobenzene	101		102		70-130
Dibromofluoromethane	108		106		70-130

SEMIVOLATILES

Project Name: LEDGE RD LANDFILL
Lab Number: L2406353
Project Number: 289302
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-01
Client ID: WRA-2
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 09:55
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8270E
Analytical Date: 02/08/24 09:53
Analyst: IM
Percent Solids: 86%

Extraction Method: EPA 3546
Extraction Date: 02/07/24 03:40

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP PAHs - Westborough Lab						
Acenaphthene	ND		ug/kg	150	--	1
Fluoranthene	160		ug/kg	110	--	1
Naphthalene	ND		ug/kg	190	--	1
Benzo(a)anthracene	ND		ug/kg	110	--	1
Benzo(a)pyrene	ND		ug/kg	150	--	1
Benzo(b)fluoranthene	ND		ug/kg	110	--	1
Benzo(k)fluoranthene	ND		ug/kg	110	--	1
Chrysene	110		ug/kg	110	--	1
Acenaphthylene	ND		ug/kg	150	--	1
Anthracene	ND		ug/kg	110	--	1
Benzo(ghi)perylene	ND		ug/kg	150	--	1
Fluorene	ND		ug/kg	190	--	1
Phenanthrene	190		ug/kg	110	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	80	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	150	--	1
Pyrene	220		ug/kg	110	--	1
2-Methylnaphthalene	ND		ug/kg	80	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	66		30-130
2-Fluorobiphenyl	68		30-130
4-Terphenyl-d14	75		30-130

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2406353
Report Date: 02/08/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E
Analytical Date: 02/08/24 08:45
Analyst: IM

Extraction Method: EPA 3546
Extraction Date: 02/07/24 03:39

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01 Batch: WG1882343-1					
Acenaphthene	ND		ug/kg	130	--
Fluoranthene	ND		ug/kg	98	--
Naphthalene	ND		ug/kg	160	--
Benzo(a)anthracene	ND		ug/kg	98	--
Benzo(a)pyrene	ND		ug/kg	130	--
Benzo(b)fluoranthene	ND		ug/kg	98	--
Benzo(k)fluoranthene	ND		ug/kg	98	--
Chrysene	ND		ug/kg	98	--
Acenaphthylene	ND		ug/kg	130	--
Anthracene	ND		ug/kg	98	--
Benzo(ghi)perylene	ND		ug/kg	130	--
Fluorene	ND		ug/kg	160	--
Phenanthrene	ND		ug/kg	98	--
Dibenzo(a,h)anthracene	ND		ug/kg	68	--
Indeno(1,2,3-cd)pyrene	ND		ug/kg	130	--
Pyrene	ND		ug/kg	98	--
2-Methylnaphthalene	ND		ug/kg	68	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	71		30-130
2-Fluorobiphenyl	77		30-130
4-Terphenyl-d14	91		30-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01 Batch: WG1882343-2 WG1882343-3								
Acenaphthene	94		85		40-140	10		30
Fluoranthene	107		97		40-140	10		30
Naphthalene	95		87		40-140	9		30
Benzo(a)anthracene	94		86		40-140	9		30
Benzo(a)pyrene	104		98		40-140	6		30
Benzo(b)fluoranthene	97		90		40-140	7		30
Benzo(k)fluoranthene	96		88		40-140	9		30
Chrysene	94		86		40-140	9		30
Acenaphthylene	104		93		40-140	11		30
Anthracene	106		96		40-140	10		30
Benzo(ghi)perylene	90		82		40-140	9		30
Fluorene	104		95		40-140	9		30
Phenanthrene	103		92		40-140	11		30
Dibenzo(a,h)anthracene	94		86		40-140	9		30
Indeno(1,2,3-cd)pyrene	100		92		40-140	8		30
Pyrene	105		95		40-140	10		30
2-Methylnaphthalene	100		89		40-140	12		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01 Batch: WG1882343-2 WG1882343-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Nitrobenzene-d5	85		79		30-130
2-Fluorobiphenyl	90		84		30-130
4-Terphenyl-d14	102		94		30-130

PETROLEUM HYDROCARBONS

Project Name: LEDGE RD LANDFILL
Lab Number: L2406353
Project Number: 289302
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-01
Client ID: WRA-2
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 09:55
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 1,8015D(M)
Analytical Date: 02/08/24 09:53
Analyst: LMR
Percent Solids: 86%

Extraction Method: EPA 3546
Extraction Date: 02/07/24 21:10

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C10-C36)	ND		ug/kg	37300	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	61		40-140

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015D(M)
Analytical Date: 02/07/24 07:57
Analyst: CRE

Extraction Method: EPA 3546
Extraction Date: 02/06/24 21:27

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbon Quantitation - Westborough Lab for sample(s): 01 Batch: WG1882298-1					
TPH (C10-C36)	ND		ug/kg	31800	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	69		40-140

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2406353

Report Date: 02/08/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 01 Batch: WG1882298-2								
TPH (C10-C36)	63		-		40-140	-		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
o-Terphenyl	67				40-140

PCBS

Project Name: LEDGE RD LANDFILL
Lab Number: L2406353
Project Number: 289302
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-01
Client ID: WRA-2
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 09:55
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8082A
Analytical Date: 02/07/24 12:46
Analyst: MHG
Percent Solids: 86%

Extraction Method: EPA 3546
Extraction Date: 02/07/24 06:16
Cleanup Method: EPA 3665A
Cleanup Date: 02/07/24
Cleanup Method: EPA 3660B
Cleanup Date: 02/07/24

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	55.9	--	1	A
Aroclor 1221	ND		ug/kg	55.9	--	1	A
Aroclor 1232	ND		ug/kg	55.9	--	1	A
Aroclor 1242	ND		ug/kg	55.9	--	1	A
Aroclor 1248	ND		ug/kg	55.9	--	1	A
Aroclor 1254	ND		ug/kg	55.9	--	1	A
Aroclor 1260	ND		ug/kg	55.9	--	1	B
Aroclor 1262	ND		ug/kg	55.9	--	1	A
Aroclor 1268	ND		ug/kg	55.9	--	1	A
PCBs, Total	ND		ug/kg	55.9	--	1	B

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	56		30-150	A
Decachlorobiphenyl	57		30-150	A
2,4,5,6-Tetrachloro-m-xylene	61		30-150	B
Decachlorobiphenyl	56		30-150	B

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2406353
Report Date: 02/08/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082A
Analytical Date: 02/07/24 08:00
Analyst: MHG

Extraction Method: EPA 3546
Extraction Date: 02/06/24 07:33
Cleanup Method: EPA 3665A
Cleanup Date: 02/07/24
Cleanup Method: EPA 3660B
Cleanup Date: 02/07/24

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01 Batch: WG1882021-1						
Aroclor 1016	ND		ug/kg	49.4	--	A
Aroclor 1221	ND		ug/kg	49.4	--	A
Aroclor 1232	ND		ug/kg	49.4	--	A
Aroclor 1242	ND		ug/kg	49.4	--	A
Aroclor 1248	ND		ug/kg	49.4	--	A
Aroclor 1254	ND		ug/kg	49.4	--	A
Aroclor 1260	ND		ug/kg	49.4	--	A
Aroclor 1262	ND		ug/kg	49.4	--	A
Aroclor 1268	ND		ug/kg	49.4	--	A
PCBs, Total	ND		ug/kg	49.4	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	72		30-150	A
Decachlorobiphenyl	83		30-150	A
2,4,5,6-Tetrachloro-m-xylene	80		30-150	B
Decachlorobiphenyl	83		30-150	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01 Batch: WG1882021-2 WG1882021-3									
Aroclor 1016	72		73		40-140	1		30	A
Aroclor 1260	75		77		40-140	3		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	69		69		30-150	A
Decachlorobiphenyl	78		78		30-150	A
2,4,5,6-Tetrachloro-m-xylene	74		74		30-150	B
Decachlorobiphenyl	77		79		30-150	B

METALS

Project Name: LEDGE RD LANDFILL **Lab Number:** L2406353

Project Number: 289302 **Report Date:** 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-01 Date Collected: 02/05/24 09:55

Client ID: WRA-2 Date Received: 02/06/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 86%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	3.51		mg/kg	2.23	--	1	02/06/24 23:28	02/07/24 08:48	EPA 3050B	97,6010D	DHL
Arsenic, Total	6.72		mg/kg	0.446	--	1	02/06/24 23:28	02/07/24 08:48	EPA 3050B	97,6010D	DHL
Barium, Total	80.7		mg/kg	0.446	--	1	02/06/24 23:28	02/07/24 08:48	EPA 3050B	97,6010D	DHL
Beryllium, Total	0.468		mg/kg	0.223	--	1	02/06/24 23:28	02/07/24 08:48	EPA 3050B	97,6010D	DHL
Cadmium, Total	0.453		mg/kg	0.446	--	1	02/06/24 23:28	02/07/24 08:48	EPA 3050B	97,6010D	DHL
Chromium, Total	13.4		mg/kg	0.446	--	1	02/06/24 23:28	02/07/24 08:48	EPA 3050B	97,6010D	DHL
Lead, Total	34.0		mg/kg	2.23	--	1	02/06/24 23:28	02/07/24 08:48	EPA 3050B	97,6010D	DHL
Mercury, Total	0.088		mg/kg	0.086	--	1	02/07/24 00:00	02/07/24 11:07	EPA 7471B	97,7471B	GMG
Nickel, Total	11.3		mg/kg	1.12	--	1	02/06/24 23:28	02/07/24 08:48	EPA 3050B	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.23	--	1	02/06/24 23:28	02/07/24 08:48	EPA 3050B	97,6010D	DHL
Silver, Total	ND		mg/kg	0.446	--	1	02/06/24 23:28	02/07/24 08:48	EPA 3050B	97,6010D	DHL
Thallium, Total	ND		mg/kg	2.23	--	1	02/06/24 23:28	02/07/24 08:48	EPA 3050B	97,6010D	DHL
Vanadium, Total	9.69		mg/kg	0.446	--	1	02/06/24 23:28	02/07/24 08:48	EPA 3050B	97,6010D	DHL
Zinc, Total	228		mg/kg	2.23	--	1	02/06/24 23:28	02/07/24 08:48	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2406353
Project Number: 289302
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-02
Client ID: WRA-1-S-2
Sample Location: ANDOVER, MA
Date Collected: 02/05/24 11:35
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 80%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.44	--	1	02/06/24 23:28	02/07/24 08:52	EPA 3050B	97,6010D	DHL
Arsenic, Total	1.89		mg/kg	0.488	--	1	02/06/24 23:28	02/07/24 08:52	EPA 3050B	97,6010D	DHL
Barium, Total	21.0		mg/kg	0.488	--	1	02/06/24 23:28	02/07/24 08:52	EPA 3050B	97,6010D	DHL
Beryllium, Total	ND		mg/kg	0.244	--	1	02/06/24 23:28	02/07/24 08:52	EPA 3050B	97,6010D	DHL
Cadmium, Total	ND		mg/kg	0.488	--	1	02/06/24 23:28	02/07/24 08:52	EPA 3050B	97,6010D	DHL
Chromium, Total	12.9		mg/kg	0.488	--	1	02/06/24 23:28	02/07/24 08:52	EPA 3050B	97,6010D	DHL
Lead, Total	2.74		mg/kg	2.44	--	1	02/06/24 23:28	02/07/24 08:52	EPA 3050B	97,6010D	DHL
Mercury, Total	ND		mg/kg	0.091	--	1	02/07/24 00:00	02/07/24 11:10	EPA 7471B	97,7471B	GMG
Nickel, Total	11.7		mg/kg	1.22	--	1	02/06/24 23:28	02/07/24 08:52	EPA 3050B	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.44	--	1	02/06/24 23:28	02/07/24 08:52	EPA 3050B	97,6010D	DHL
Silver, Total	ND		mg/kg	0.488	--	1	02/06/24 23:28	02/07/24 08:52	EPA 3050B	97,6010D	DHL
Thallium, Total	ND		mg/kg	2.44	--	1	02/06/24 23:28	02/07/24 08:52	EPA 3050B	97,6010D	DHL
Vanadium, Total	6.96		mg/kg	0.488	--	1	02/06/24 23:28	02/07/24 08:52	EPA 3050B	97,6010D	DHL
Zinc, Total	19.7		mg/kg	2.44	--	1	02/06/24 23:28	02/07/24 08:52	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2406353
Project Number: 289302
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-03
Client ID: WRA-1-S-1
Sample Location: ANDOVER, MA
Date Collected: 02/05/24 11:45
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 84%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.38	--	1	02/06/24 23:28	02/07/24 08:55	EPA 3050B	97,6010D	DHL
Arsenic, Total	0.893		mg/kg	0.476	--	1	02/06/24 23:28	02/07/24 08:55	EPA 3050B	97,6010D	DHL
Barium, Total	12.3		mg/kg	0.476	--	1	02/06/24 23:28	02/07/24 08:55	EPA 3050B	97,6010D	DHL
Beryllium, Total	ND		mg/kg	0.238	--	1	02/06/24 23:28	02/07/24 08:55	EPA 3050B	97,6010D	DHL
Cadmium, Total	ND		mg/kg	0.476	--	1	02/06/24 23:28	02/07/24 08:55	EPA 3050B	97,6010D	DHL
Chromium, Total	8.15		mg/kg	0.476	--	1	02/06/24 23:28	02/07/24 08:55	EPA 3050B	97,6010D	DHL
Lead, Total	ND		mg/kg	2.38	--	1	02/06/24 23:28	02/07/24 08:55	EPA 3050B	97,6010D	DHL
Mercury, Total	ND		mg/kg	0.088	--	1	02/07/24 00:00	02/07/24 11:20	EPA 7471B	97,7471B	GMG
Nickel, Total	7.69		mg/kg	1.19	--	1	02/06/24 23:28	02/07/24 08:55	EPA 3050B	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.38	--	1	02/06/24 23:28	02/07/24 08:55	EPA 3050B	97,6010D	DHL
Silver, Total	ND		mg/kg	0.476	--	1	02/06/24 23:28	02/07/24 08:55	EPA 3050B	97,6010D	DHL
Thallium, Total	ND		mg/kg	2.38	--	1	02/06/24 23:28	02/07/24 08:55	EPA 3050B	97,6010D	DHL
Vanadium, Total	4.54		mg/kg	0.476	--	1	02/06/24 23:28	02/07/24 08:55	EPA 3050B	97,6010D	DHL
Zinc, Total	11.4		mg/kg	2.38	--	1	02/06/24 23:28	02/07/24 08:55	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL **Lab Number:** L2406353

Project Number: 289302 **Report Date:** 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-04 Date Collected: 02/05/24 11:55

Client ID: WRA-1-N-5 Date Received: 02/06/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 83%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.32	--	1	02/06/24 23:28	02/07/24 08:58	EPA 3050B	97,6010D	DHL
Arsenic, Total	0.662		mg/kg	0.464	--	1	02/06/24 23:28	02/07/24 08:58	EPA 3050B	97,6010D	DHL
Barium, Total	8.84		mg/kg	0.464	--	1	02/06/24 23:28	02/07/24 08:58	EPA 3050B	97,6010D	DHL
Beryllium, Total	ND		mg/kg	0.232	--	1	02/06/24 23:28	02/07/24 08:58	EPA 3050B	97,6010D	DHL
Cadmium, Total	ND		mg/kg	0.464	--	1	02/06/24 23:28	02/07/24 08:58	EPA 3050B	97,6010D	DHL
Chromium, Total	6.74		mg/kg	0.464	--	1	02/06/24 23:28	02/07/24 08:58	EPA 3050B	97,6010D	DHL
Lead, Total	ND		mg/kg	2.32	--	1	02/06/24 23:28	02/07/24 08:58	EPA 3050B	97,6010D	DHL
Mercury, Total	ND		mg/kg	0.087	--	1	02/07/24 00:00	02/07/24 11:24	EPA 7471B	97,7471B	GMG
Nickel, Total	5.64		mg/kg	1.16	--	1	02/06/24 23:28	02/07/24 08:58	EPA 3050B	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.32	--	1	02/06/24 23:28	02/07/24 08:58	EPA 3050B	97,6010D	DHL
Silver, Total	ND		mg/kg	0.464	--	1	02/06/24 23:28	02/07/24 08:58	EPA 3050B	97,6010D	DHL
Thallium, Total	ND		mg/kg	2.32	--	1	02/06/24 23:28	02/07/24 08:58	EPA 3050B	97,6010D	DHL
Vanadium, Total	3.34		mg/kg	0.464	--	1	02/06/24 23:28	02/07/24 08:58	EPA 3050B	97,6010D	DHL
Zinc, Total	4.79		mg/kg	2.32	--	1	02/06/24 23:28	02/07/24 08:58	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2406353
Project Number: 289302
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-05
Client ID: WRA-1-N-4
Sample Location: ANDOVER, MA
Date Collected: 02/05/24 13:10
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 87%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.27	--	1	02/06/24 23:28	02/07/24 09:01	EPA 3050B	97,6010D	DHL
Arsenic, Total	86.8		mg/kg	0.454	--	1	02/06/24 23:28	02/07/24 09:01	EPA 3050B	97,6010D	DHL
Barium, Total	39.0		mg/kg	0.454	--	1	02/06/24 23:28	02/07/24 09:01	EPA 3050B	97,6010D	DHL
Beryllium, Total	0.323		mg/kg	0.227	--	1	02/06/24 23:28	02/07/24 09:01	EPA 3050B	97,6010D	DHL
Cadmium, Total	ND		mg/kg	0.454	--	1	02/06/24 23:28	02/07/24 09:01	EPA 3050B	97,6010D	DHL
Chromium, Total	23.3		mg/kg	0.454	--	1	02/06/24 23:28	02/07/24 09:01	EPA 3050B	97,6010D	DHL
Lead, Total	12.0		mg/kg	2.27	--	1	02/06/24 23:28	02/07/24 09:01	EPA 3050B	97,6010D	DHL
Mercury, Total	ND		mg/kg	0.083	--	1	02/07/24 00:00	02/07/24 11:27	EPA 7471B	97,7471B	GMG
Nickel, Total	16.2		mg/kg	1.14	--	1	02/06/24 23:28	02/07/24 09:01	EPA 3050B	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.27	--	1	02/06/24 23:28	02/07/24 09:01	EPA 3050B	97,6010D	DHL
Silver, Total	ND		mg/kg	0.454	--	1	02/06/24 23:28	02/07/24 09:01	EPA 3050B	97,6010D	DHL
Thallium, Total	ND		mg/kg	2.27	--	1	02/06/24 23:28	02/07/24 09:01	EPA 3050B	97,6010D	DHL
Vanadium, Total	11.3		mg/kg	0.454	--	1	02/06/24 23:28	02/07/24 09:01	EPA 3050B	97,6010D	DHL
Zinc, Total	64.0		mg/kg	2.27	--	1	02/06/24 23:28	02/07/24 09:01	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2406353
Project Number: 289302
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-06
Client ID: WRA-1-N-3
Sample Location: ANDOVER, MA
Date Collected: 02/05/24 13:45
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 90%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.19	--	1	02/06/24 23:28	02/07/24 09:04	EPA 3050B	97,6010D	DHL
Arsenic, Total	6.30		mg/kg	0.437	--	1	02/06/24 23:28	02/07/24 09:04	EPA 3050B	97,6010D	DHL
Barium, Total	19.5		mg/kg	0.437	--	1	02/06/24 23:28	02/07/24 09:04	EPA 3050B	97,6010D	DHL
Beryllium, Total	0.226		mg/kg	0.219	--	1	02/06/24 23:28	02/07/24 09:04	EPA 3050B	97,6010D	DHL
Cadmium, Total	ND		mg/kg	0.437	--	1	02/06/24 23:28	02/07/24 09:04	EPA 3050B	97,6010D	DHL
Chromium, Total	10.4		mg/kg	0.437	--	1	02/06/24 23:28	02/07/24 09:04	EPA 3050B	97,6010D	DHL
Lead, Total	3.47		mg/kg	2.19	--	1	02/06/24 23:28	02/07/24 09:04	EPA 3050B	97,6010D	DHL
Mercury, Total	ND		mg/kg	0.083	--	1	02/07/24 00:00	02/07/24 11:30	EPA 7471B	97,7471B	GMG
Nickel, Total	11.1		mg/kg	1.09	--	1	02/06/24 23:28	02/07/24 09:04	EPA 3050B	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.19	--	1	02/06/24 23:28	02/07/24 09:04	EPA 3050B	97,6010D	DHL
Silver, Total	ND		mg/kg	0.437	--	1	02/06/24 23:28	02/07/24 09:04	EPA 3050B	97,6010D	DHL
Thallium, Total	ND		mg/kg	2.19	--	1	02/06/24 23:28	02/07/24 09:04	EPA 3050B	97,6010D	DHL
Vanadium, Total	7.31		mg/kg	0.437	--	1	02/06/24 23:28	02/07/24 09:04	EPA 3050B	97,6010D	DHL
Zinc, Total	33.7		mg/kg	2.19	--	1	02/06/24 23:28	02/07/24 09:04	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2406353
Project Number: 289302
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-07
Client ID: WRA-1-N-2
Sample Location: ANDOVER, MA
Date Collected: 02/05/24 14:10
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 84%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.30	--	1	02/06/24 23:28	02/07/24 09:08	EPA 3050B	97,6010D	DHL
Arsenic, Total	5.34		mg/kg	0.460	--	1	02/06/24 23:28	02/07/24 09:08	EPA 3050B	97,6010D	DHL
Barium, Total	12.2		mg/kg	0.460	--	1	02/06/24 23:28	02/07/24 09:08	EPA 3050B	97,6010D	DHL
Beryllium, Total	0.239		mg/kg	0.230	--	1	02/06/24 23:28	02/07/24 09:08	EPA 3050B	97,6010D	DHL
Cadmium, Total	ND		mg/kg	0.460	--	1	02/06/24 23:28	02/07/24 09:08	EPA 3050B	97,6010D	DHL
Chromium, Total	11.5		mg/kg	0.460	--	1	02/06/24 23:28	02/07/24 09:08	EPA 3050B	97,6010D	DHL
Lead, Total	2.70		mg/kg	2.30	--	1	02/06/24 23:28	02/07/24 09:08	EPA 3050B	97,6010D	DHL
Mercury, Total	ND		mg/kg	0.087	--	1	02/07/24 00:00	02/07/24 11:34	EPA 7471B	97,7471B	GMG
Nickel, Total	12.0		mg/kg	1.15	--	1	02/06/24 23:28	02/07/24 09:08	EPA 3050B	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.30	--	1	02/06/24 23:28	02/07/24 09:08	EPA 3050B	97,6010D	DHL
Silver, Total	ND		mg/kg	0.460	--	1	02/06/24 23:28	02/07/24 09:08	EPA 3050B	97,6010D	DHL
Thallium, Total	ND		mg/kg	2.30	--	1	02/06/24 23:28	02/07/24 09:08	EPA 3050B	97,6010D	DHL
Vanadium, Total	8.59		mg/kg	0.460	--	1	02/06/24 23:28	02/07/24 09:08	EPA 3050B	97,6010D	DHL
Zinc, Total	11.9		mg/kg	2.30	--	1	02/06/24 23:28	02/07/24 09:08	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2406353
Project Number: 289302
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-08
Client ID: WRA-1-N-1
Sample Location: ANDOVER, MA
Date Collected: 02/05/24 14:20
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 83%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.32	--	1	02/06/24 23:28	02/07/24 09:33	EPA 3050B	97,6010D	DHL
Arsenic, Total	13.5		mg/kg	0.465	--	1	02/06/24 23:28	02/07/24 09:33	EPA 3050B	97,6010D	DHL
Barium, Total	39.0		mg/kg	0.465	--	1	02/06/24 23:28	02/07/24 09:33	EPA 3050B	97,6010D	DHL
Beryllium, Total	0.516		mg/kg	0.232	--	1	02/06/24 23:28	02/07/24 09:33	EPA 3050B	97,6010D	DHL
Cadmium, Total	ND		mg/kg	0.465	--	1	02/06/24 23:28	02/07/24 09:33	EPA 3050B	97,6010D	DHL
Chromium, Total	24.7		mg/kg	0.465	--	1	02/06/24 23:28	02/07/24 09:33	EPA 3050B	97,6010D	DHL
Lead, Total	4.19		mg/kg	2.32	--	1	02/06/24 23:28	02/07/24 09:33	EPA 3050B	97,6010D	DHL
Mercury, Total	ND		mg/kg	0.091	--	1	02/07/24 00:00	02/07/24 11:37	EPA 7471B	97,7471B	GMG
Nickel, Total	15.7		mg/kg	1.16	--	1	02/06/24 23:28	02/07/24 09:33	EPA 3050B	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.32	--	1	02/06/24 23:28	02/07/24 09:33	EPA 3050B	97,6010D	DHL
Silver, Total	ND		mg/kg	0.465	--	1	02/06/24 23:28	02/07/24 09:33	EPA 3050B	97,6010D	DHL
Thallium, Total	ND		mg/kg	2.32	--	1	02/06/24 23:28	02/07/24 09:33	EPA 3050B	97,6010D	DHL
Vanadium, Total	21.5		mg/kg	0.465	--	1	02/06/24 23:28	02/07/24 09:33	EPA 3050B	97,6010D	DHL
Zinc, Total	28.2		mg/kg	2.32	--	1	02/06/24 23:28	02/07/24 09:33	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2406353
Project Number: 289302
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-09
Client ID: WRA-1-S-5
Sample Location: ANDOVER, MA
Date Collected: 02/05/24 14:45
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 84%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.30	--	1	02/06/24 23:28	02/07/24 10:11	EPA 3050B	97,6010D	DHL
Arsenic, Total	6.58		mg/kg	0.460	--	1	02/06/24 23:28	02/07/24 10:11	EPA 3050B	97,6010D	DHL
Barium, Total	46.4		mg/kg	0.460	--	1	02/06/24 23:28	02/07/24 10:11	EPA 3050B	97,6010D	DHL
Beryllium, Total	0.380		mg/kg	0.230	--	1	02/06/24 23:28	02/07/24 10:11	EPA 3050B	97,6010D	DHL
Cadmium, Total	15.7		mg/kg	0.460	--	1	02/06/24 23:28	02/07/24 10:11	EPA 3050B	97,6010D	DHL
Chromium, Total	16.6		mg/kg	0.460	--	1	02/06/24 23:28	02/07/24 10:11	EPA 3050B	97,6010D	DHL
Lead, Total	24.5		mg/kg	2.30	--	1	02/06/24 23:28	02/07/24 10:11	EPA 3050B	97,6010D	DHL
Mercury, Total	ND		mg/kg	0.089	--	1	02/07/24 00:00	02/07/24 11:40	EPA 7471B	97,7471B	GMG
Nickel, Total	13.7		mg/kg	1.15	--	1	02/06/24 23:28	02/07/24 10:11	EPA 3050B	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.30	--	1	02/06/24 23:28	02/07/24 10:11	EPA 3050B	97,6010D	DHL
Silver, Total	ND		mg/kg	0.460	--	1	02/06/24 23:28	02/07/24 10:11	EPA 3050B	97,6010D	DHL
Thallium, Total	ND		mg/kg	2.30	--	1	02/06/24 23:28	02/07/24 10:11	EPA 3050B	97,6010D	DHL
Vanadium, Total	9.96		mg/kg	0.460	--	1	02/06/24 23:28	02/07/24 10:11	EPA 3050B	97,6010D	DHL
Zinc, Total	114		mg/kg	2.30	--	1	02/06/24 23:28	02/07/24 10:11	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL **Lab Number:** L2406353

Project Number: 289302 **Report Date:** 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-10 Date Collected: 02/05/24 15:40

Client ID: WRA-1-S-3 Date Received: 02/06/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 82%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.42	--	1	02/06/24 23:28	02/07/24 10:14	EPA 3050B	97,6010D	DHL
Arsenic, Total	1.75		mg/kg	0.483	--	1	02/06/24 23:28	02/07/24 10:14	EPA 3050B	97,6010D	DHL
Barium, Total	8.33		mg/kg	0.483	--	1	02/06/24 23:28	02/07/24 10:14	EPA 3050B	97,6010D	DHL
Beryllium, Total	ND		mg/kg	0.242	--	1	02/06/24 23:28	02/07/24 10:14	EPA 3050B	97,6010D	DHL
Cadmium, Total	ND		mg/kg	0.483	--	1	02/06/24 23:28	02/07/24 10:14	EPA 3050B	97,6010D	DHL
Chromium, Total	4.81		mg/kg	0.483	--	1	02/06/24 23:28	02/07/24 10:14	EPA 3050B	97,6010D	DHL
Lead, Total	2.91		mg/kg	2.42	--	1	02/06/24 23:28	02/07/24 10:14	EPA 3050B	97,6010D	DHL
Mercury, Total	ND		mg/kg	0.090	--	1	02/07/24 00:00	02/07/24 11:43	EPA 7471B	97,7471B	GMG
Nickel, Total	8.07		mg/kg	1.21	--	1	02/06/24 23:28	02/07/24 10:14	EPA 3050B	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.42	--	1	02/06/24 23:28	02/07/24 10:14	EPA 3050B	97,6010D	DHL
Silver, Total	ND		mg/kg	0.483	--	1	02/06/24 23:28	02/07/24 10:14	EPA 3050B	97,6010D	DHL
Thallium, Total	ND		mg/kg	2.42	--	1	02/06/24 23:28	02/07/24 10:14	EPA 3050B	97,6010D	DHL
Vanadium, Total	3.06		mg/kg	0.483	--	1	02/06/24 23:28	02/07/24 10:14	EPA 3050B	97,6010D	DHL
Zinc, Total	14.1		mg/kg	2.42	--	1	02/06/24 23:28	02/07/24 10:14	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL **Lab Number:** L2406353

Project Number: 289302 **Report Date:** 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-11 Date Collected: 02/05/24 15:50

Client ID: WRA-1-S-4 Date Received: 02/06/24

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 85%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.34	--	1	02/06/24 23:28	02/07/24 10:17	EPA 3050B	97,6010D	DHL
Arsenic, Total	2.63		mg/kg	0.468	--	1	02/06/24 23:28	02/07/24 10:17	EPA 3050B	97,6010D	DHL
Barium, Total	23.4		mg/kg	0.468	--	1	02/06/24 23:28	02/07/24 10:17	EPA 3050B	97,6010D	DHL
Beryllium, Total	ND		mg/kg	0.234	--	1	02/06/24 23:28	02/07/24 10:17	EPA 3050B	97,6010D	DHL
Cadmium, Total	ND		mg/kg	0.468	--	1	02/06/24 23:28	02/07/24 10:17	EPA 3050B	97,6010D	DHL
Chromium, Total	15.5		mg/kg	0.468	--	1	02/06/24 23:28	02/07/24 10:17	EPA 3050B	97,6010D	DHL
Lead, Total	3.40		mg/kg	2.34	--	1	02/06/24 23:28	02/07/24 10:17	EPA 3050B	97,6010D	DHL
Mercury, Total	ND		mg/kg	0.084	--	1	02/07/24 00:00	02/07/24 11:47	EPA 7471B	97,7471B	GMG
Nickel, Total	11.5		mg/kg	1.17	--	1	02/06/24 23:28	02/07/24 10:17	EPA 3050B	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.34	--	1	02/06/24 23:28	02/07/24 10:17	EPA 3050B	97,6010D	DHL
Silver, Total	ND		mg/kg	0.468	--	1	02/06/24 23:28	02/07/24 10:17	EPA 3050B	97,6010D	DHL
Thallium, Total	ND		mg/kg	2.34	--	1	02/06/24 23:28	02/07/24 10:17	EPA 3050B	97,6010D	DHL
Vanadium, Total	10.6		mg/kg	0.468	--	1	02/06/24 23:28	02/07/24 10:17	EPA 3050B	97,6010D	DHL
Zinc, Total	25.4		mg/kg	2.34	--	1	02/06/24 23:28	02/07/24 10:17	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL **Lab Number:** L2406353

Project Number: 289302 **Report Date:** 02/08/24

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-11 Batch: WG1882301-1										
Antimony, Total	ND		mg/kg	2.00	--	1	02/06/24 23:28	02/07/24 08:38	97,6010D	DHL
Arsenic, Total	ND		mg/kg	0.400	--	1	02/06/24 23:28	02/07/24 08:38	97,6010D	DHL
Barium, Total	ND		mg/kg	0.400	--	1	02/06/24 23:28	02/07/24 08:38	97,6010D	DHL
Beryllium, Total	ND		mg/kg	0.200	--	1	02/06/24 23:28	02/07/24 08:38	97,6010D	DHL
Cadmium, Total	ND		mg/kg	0.400	--	1	02/06/24 23:28	02/07/24 08:38	97,6010D	DHL
Chromium, Total	ND		mg/kg	0.400	--	1	02/06/24 23:28	02/07/24 08:38	97,6010D	DHL
Lead, Total	ND		mg/kg	2.00	--	1	02/06/24 23:28	02/07/24 08:38	97,6010D	DHL
Nickel, Total	ND		mg/kg	1.00	--	1	02/06/24 23:28	02/07/24 08:38	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.00	--	1	02/06/24 23:28	02/07/24 08:38	97,6010D	DHL
Silver, Total	ND		mg/kg	0.400	--	1	02/06/24 23:28	02/07/24 08:38	97,6010D	DHL
Thallium, Total	ND		mg/kg	2.00	--	1	02/06/24 23:28	02/07/24 08:38	97,6010D	DHL
Vanadium, Total	ND		mg/kg	0.400	--	1	02/06/24 23:28	02/07/24 08:38	97,6010D	DHL
Zinc, Total	ND		mg/kg	2.00	--	1	02/06/24 23:28	02/07/24 08:38	97,6010D	DHL

Prep Information

Digestion Method: EPA 3050B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-11 Batch: WG1882302-1										
Mercury, Total	ND		mg/kg	0.083	--	1	02/07/24 00:00	02/07/24 10:57	97,7471B	GMG

Prep Information

Digestion Method: EPA 7471B

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2406353

Report Date: 02/08/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-11 Batch: WG1882301-2 WG1882301-3 SRM Lot Number: D122-540								
Antimony, Total	159		159		6-194	0		30
Arsenic, Total	110		105		81-119	5		30
Barium, Total	101		100		83-117	1		30
Beryllium, Total	99		105		83-117	6		30
Cadmium, Total	100		99		83-117	1		30
Chromium, Total	98		98		82-118	0		30
Lead, Total	108		102		83-117	6		30
Nickel, Total	103		101		83-117	2		30
Selenium, Total	116		112		81-119	4		30
Silver, Total	108		103		80-120	5		30
Thallium, Total	110		107		81-119	3		30
Vanadium, Total	97		94		80-120	3		30
Zinc, Total	99		96		82-119	3		30
MCP Total Metals - Mansfield Lab Associated sample(s): 01-11 Batch: WG1882302-2 WG1882302-3 SRM Lot Number: D122-540								
Mercury, Total	96		93		73-127	3		30

INORGANICS
&
MISCELLANEOUS

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-01
Client ID: WRA-2
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 09:55
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	86.3		%	0.100	NA	1	-	02/06/24 21:52	121,2540G	SJB

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-02
Client ID: WRA-1-S-2
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 11:35
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	79.8		%	0.100	NA	1	-	02/06/24 21:52	121,2540G	SJB

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-03
Client ID: WRA-1-S-1
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 11:45
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	83.5		%	0.100	NA	1	-	02/06/24 21:52	121,2540G	SJB

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-04
Client ID: WRA-1-N-5
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 11:55
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	82.6		%	0.100	NA	1	-	02/06/24 21:52	121,2540G	SJB

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-05
Client ID: WRA-1-N-4
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 13:10
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	87.1		%	0.100	NA	1	-	02/06/24 21:52	121,2540G	SJB

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-06
Client ID: WRA-1-N-3
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 13:45
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	90.3		%	0.100	NA	1	-	02/06/24 21:52	121,2540G	SJB

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-07
Client ID: WRA-1-N-2
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 14:10
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	83.6		%	0.100	NA	1	-	02/06/24 21:52	121,2540G	SJB

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-08
Client ID: WRA-1-N-1
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 14:20
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	82.6		%	0.100	NA	1	-	02/06/24 21:52	121,2540G	SJB

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-09
Client ID: WRA-1-S-5
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 14:45
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	84.1		%	0.100	NA	1	-	02/06/24 21:52	121,2540G	SJB

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-10
Client ID: WRA-1-S-3
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 15:40
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	81.8		%	0.100	NA	1	-	02/06/24 21:52	121,2540G	SJB

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

SAMPLE RESULTS

Lab ID: L2406353-11
Client ID: WRA-1-S-4
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 15:50
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	85.0		%	0.100	NA	1	-	02/06/24 21:52	121,2540G	SJB

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2406353-01A	Vial MeOH preserved	A	NA		4.3	Y	Absent		MCP-8260HLW-21(14)
L2406353-01B	Vial water preserved	A	NA		4.3	Y	Absent	06-FEB-24 15:33	MCP-8260HLW-21(14)
L2406353-01C	Vial water preserved	A	NA		4.3	Y	Absent	06-FEB-24 15:33	MCP-8260HLW-21(14)
L2406353-01D	Plastic 2oz unpreserved for TS	A	NA		4.3	Y	Absent		TS(7)
L2406353-01E	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-CD-6010T-10(180),MCP-7471T-10(28),MCP-TL-6010T-10(180),MCP-ZN-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-PB-6010T-10(180),MCP-NI-6010T-10(180)
L2406353-01F	Glass 250ml/8oz unpreserved	A	NA		4.3	Y	Absent		MCP-8082-10(365),MCP-PAH-21(14),TPH-DRO-D(14)
L2406353-02A	Plastic 2oz unpreserved for TS	A	NA		4.3	Y	Absent		TS(7)
L2406353-02B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-TL-6010T-10(180),MCP-CD-6010T-10(180),MCP-ZN-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-V-6010T-10(180),MCP-BA-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L2406353-03A	Plastic 2oz unpreserved for TS	A	NA		4.3	Y	Absent		TS(7)
L2406353-03B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-TL-6010T-10(180),MCP-SB-6010T-10(180),MCP-ZN-6010T-10(180),MCP-AG-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L2406353-04A	Plastic 2oz unpreserved for TS	A	NA		4.3	Y	Absent		TS(7)

*Values in parentheses indicate holding time in days

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2406353-04B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-TL-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-AG-6010T-10(180),MCP-ZN-6010T-10(180),MCP-SB-6010T-10(180),MCP-SE-6010T-10(180),MCP-BE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L2406353-05A	Plastic 2oz unpreserved for TS	A	NA		4.3	Y	Absent		TS(7)
L2406353-05B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-TL-6010T-10(180),MCP-SB-6010T-10(180),MCP-ZN-6010T-10(180),MCP-AG-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-V-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180),MCP-NI-6010T-10(180)
L2406353-06A	Plastic 2oz unpreserved for TS	A	NA		4.3	Y	Absent		TS(7)
L2406353-06B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-TL-6010T-10(180),MCP-CD-6010T-10(180),MCP-ZN-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-SE-6010T-10(180),MCP-BE-6010T-10(180),MCP-V-6010T-10(180),MCP-BA-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L2406353-07A	Plastic 2oz unpreserved for TS	A	NA		4.3	Y	Absent		TS(7)
L2406353-07B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-CD-6010T-10(180),MCP-7471T-10(28),MCP-TL-6010T-10(180),MCP-SB-6010T-10(180),MCP-ZN-6010T-10(180),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-PB-6010T-10(180),MCP-NI-6010T-10(180)
L2406353-08A	Plastic 2oz unpreserved for TS	A	NA		4.3	Y	Absent		TS(7)
L2406353-08B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-TL-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-ZN-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-PB-6010T-10(180),MCP-NI-6010T-10(180)
L2406353-09A	Plastic 2oz unpreserved for TS	A	NA		4.3	Y	Absent		TS(7)

*Values in parentheses indicate holding time in days

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2406353
Report Date: 02/08/24

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2406353-09B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-TL-6010T-10(180),MCP-CD-6010T-10(180),MCP-ZN-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-PB-6010T-10(180),MCP-NI-6010T-10(180)
L2406353-10A	Plastic 2oz unpreserved for TS	A	NA		4.3	Y	Absent		TS(7)
L2406353-10B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-TL-6010T-10(180),MCP-CD-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-ZN-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-V-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180),MCP-NI-6010T-10(180)
L2406353-11A	Plastic 2oz unpreserved for TS	A	NA		4.3	Y	Absent		TS(7)
L2406353-11B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.3	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-TL-6010T-10(180),MCP-ZN-6010T-10(180),MCP-SB-6010T-10(180),MCP-AG-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-V-6010T-10(180),MCP-BA-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)

*Values in parentheses indicate holding time in days

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2406353
Project Number:	289302	**Report Date:**	02/08/24

GLOSSARY

Acronyms

DL - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EMPC - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LOD - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

LOQ - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

NR - No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TEF - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.

TEQ - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2406353
Project Number:	289302	**Report Date:**	02/08/24

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2406353
Project Number:	289302	**Report Date:**	02/08/24

Data Qualifiers

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: Data Usability Report

Project Name: LEDGE RD LANDFILL **Lab Number:** L2406353

Project Number: 289302 **Report Date:** 02/08/24

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010 and WSC-CAM-IIIA and IIID, January 2024.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

141 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA and IIB, November 2021.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 2/16/24

ALPHA Job #: L2406393

ALPHA ANALYTICAL
8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220
320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Project Information

Project Name: Ledge Rd Landfill
Project Location: Andover, MA
Project #: 289362
Project Manager: Nathan Jones
ALPHA Quote #:

Report Information - Data Deliverables

☑ ADEx ☐ EMAIL

Billing Information

☑ Same as Client Info PO #:

Client Information

Client: CDM Smith
Address: 75 State Street, Suite 701
Boston, MA 02109
Phone: 617-452-6563
Email: JonesNA2@cdmsmith.com

Regulatory Requirements & Project Information Requirements

☑ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods
☐ Yes ☑ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☑ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☑ No NPDES RGP
☐ Other State /Fed Program _____ Criteria _____

Turn-Around Time

☐ Standard ☑ RUSH (only confirmed if pre-approved)
Date Due:

Additional Project Information:

Detection limits for each parameter shall be less than reportable concentrations for RCS-1 criteria

ANALYSIS

VOC: ☐ 8260 ☐ 624 ☐ 524.2
SVOC: ☐ 8270 ☐ PAH
METALS: ☐ MCP 13 ☐ RCP 14 ☐ RCP 15
METALS: ☐ RCRA8 ☐ RCRA9 ☐ PP13
EPH: ☐ Ranges & Targets ☐ Ranges Only
VPH: ☐ Ranges & Targets ☐ Ranges Only
8 PCB ☐ PEST EPA 508.1
TCN: ☐ Cyanide Only ☐ Reactivity
TPH - MassDEP (Rev. 2.0)
PAHs - EPA 8270

SAMPLE INFO

Filtration
☐ Field
☐ Lab to do
Preservation
☐ Lab to do

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	VOC	SVOC	METALS	EPH	VPH	PCB	TCN	TPH	PAHs	Sample Comments
L2406393 01	WRA-2	2/15/24	0955	Soil	ET	X	X				X		X	X	
02	WRA-1-S-2		1135				X								
03	WRA-1-S-1		1145				X								
04	WRA-1-N-5		1155				X								
05	WRA-1-N-4		1310				X								
06	WRA-1-N-3		1345				X								
07	WRA-1-N-2		1410				X								
08	WRA-1-N-1		1426				X								
09	WRA-1-S-5		1440				X								
10	WRA-1-S-3		1046				X								
	WRA-1-S-4		1050				X								

Container Type										
Preservative										

Container Type: P= Plastic, A= Amber glass, V= Vial, G= Glass, B= Bacteria cup, C= Cube, O= Other, E= Encore, D= BOD Bottle

Preservative: A= None, B= HCl, C= HNO_3, D= H_2SO_4, E= NaOH, F= MeOH, G= $NaHSO_4$, H= $NaAsO_2$/$NaOH$, I= Ascorbic Acid, J= NH_4Cl, K= Zn Acetate, O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	11:21 2/15/24	[signature] DAUGHAL	2-16-24 11:21
[signature] DAUGHAL	2-16-24 14:50	[signature]	2/16/24 14:50

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

Method Blank Summary
Form 4
Volatiles

Client	: CDM Smith, Inc.	**Lab Number**	: L2406353
Project Name	: LEDGE RD LANDFILL	**Project Number**	: 289302
Lab Sample ID	: WG1882758-5	**Lab File ID**	: V17240207B05
Instrument ID	: VOA117		
Matrix	: SOIL	**Analysis Date**	: 02/07/24 11:14

Client Sample No.	Lab Sample ID	Analysis Date
WG1882758-3LCS	WG1882758-3	02/07/24 09:29
WG1882758-4LCSD	WG1882758-4	02/07/24 09:55
WRA-2	L2406353-01	02/07/24 11:40

Calibration Verification Summary
Form 7
Volatiles

Client	: CDM Smith, Inc.	**Lab Number**	: L2406353
Project Name	: LEDGE RD LANDFILL	**Project Number**	: 289302
Instrument ID	: VOA117	**Calibration Date**	: 02/07/24 09:29
Lab File ID	: V17240207B01	**Init. Calib. Date(s)**	: 12/14/23 12/14/23
Sample No	: WG1882758-2	**Init. Calib. Times**	: 14:50 19:41
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
Fluorobenzene	1	1	-	0	20	108	0
Dichlorodifluoromethane	0.26	0.236	-	9.2	20	114	0
Chloromethane	0.245	0.262	-	-6.9	20	130	0
Vinyl chloride	0.35	0.293	-	16.3	20	100	0
Bromomethane	0.404	0.269	-	33.4*	20	82	0
Chloroethane	0.291	0.196	-	32.6*	20	86	0
Trichlorofluoromethane	0.628	0.444	-	29.3*	20	88	0
Ethyl ether	0.154	0.106	-	31.2*	20	80	0
1,1-Dichloroethene	0.355	0.257	-	27.6*	20	88	0
Carbon disulfide	1.215	0.862	-	29.1*	20	90	0
Freon-113	0.409	0.255	-	37.7*	20	79	0
Acrolein	0.017	0.016	-	5.9	20	111	0
Methylene chloride	0.221	0.22	-	0.5	20	132	0
Acetone	40	35.522	-	11.2	20	110	-.01
trans-1,2-Dichloroethene	0.219	0.246	-	-12.3	20	138	0
Methyl acetate	0.079	0.07	-	11.4	20	114	0
Methyl tert-butyl ether	0.435	0.421	-	3.2	20	113	0
tert-Butyl alcohol	0.012	0.01	-	16.7	20	102	0
Diisopropyl ether	0.544	0.548	-	-0.7	20	115	0
1,1-Dichloroethane	0.357	0.377	-	-5.6	20	126	0
Halothane	0.177	0.215	-	-21.5*	20	150	0
Acrylonitrile	0.032	0.031	-	3.1	20	110	-.01
Ethyl tert-butyl ether	0.511	0.492	-	3.7	20	111	0
Vinyl acetate	0.298	0.308	-	-3.4	20	119	0
cis-1,2-Dichloroethene	0.24	0.255	-	-6.3	20	125	0
2,2-Dichloropropane	0.3	0.346	-	-15.3	20	139	-.01
Bromochloromethane	0.109	0.127	-	-16.5	20	137	0
Cyclohexane	0.326	0.286	-	12.3	20	108	0
Chloroform	0.387	0.426	-	-10.1	20	130	0
Ethyl acetate	0.11	0.099	-	10	20	103	0
Carbon tetrachloride	0.307	0.395	-	-28.7*	20	153	0
Tetrahydrofuran	0.031	0.028	-	9.7	20	104	0
Dibromofluoromethane	0.261	0.282	-	-8	20	123	0
1,1,1-Trichloroethane	0.334	0.401	-	-20.1*	20	142	0
2-Butanone	0.049	0.04	-	18.4	20	105	0
1,1-Dichloropropene	0.274	0.303	-	-10.6	20	128	0
Benzene	0.79	0.839	-	-6.2	20	120	0
tert-Amyl methyl ether	0.467	0.419	-	10.3	20	99	0
1,2-Dichloroethane-d4	0.229	0.214	-	6.6	20	104	0
1,2-Dichloroethane	0.227	0.228	-	-0.4	20	112	0
Methyl cyclohexane	0.385	0.325	-	15.6	20	100	0
Trichloroethene	0.243	0.256	-	-5.3	20	122	0
Dibromomethane	0.112	0.117	-	-4.5	20	116	-.01

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: CDM Smith, Inc.	**Lab Number**	: L2406353
Project Name	: LEDGE RD LANDFILL	**Project Number**	: 289302
Instrument ID	: VOA117	**Calibration Date**	: 02/07/24 09:29
Lab File ID	: V17240207B01	**Init. Calib. Date(s)**	: 12/14/23 12/14/23
Sample No	: WG1882758-2	**Init. Calib. Times**	: 14:50 19:41
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
1,2-Dichloropropane	0.19	0.189	-	0.5	20	109	0
2-Chloroethyl vinyl ether	0.086	0.051	-	40.7*	20	65	0
Bromodichloromethane	0.266	0.294*	-	-10.5	20	118	0
1,4-Dioxane	0.0013	0.00125*	-	3.8	20	97	0
cis-1,3-Dichloropropene	0.276	0.307	-	-11.2	20	114	0
Chlorobenzene-d5	1	1	-	0	20	110	0
Toluene-d8	1.238	1.174	-	5.2	20	105	0
Toluene	0.665	0.675	-	-1.5	20	118	0
4-Methyl-2-pentanone	0.05	0.038	-	24*	20	84	-.01
Tetrachloroethene	0.305	0.354	-	-16.1	20	130	0
trans-1,3-Dichloropropene	40	38.324	-	4.2	20	113	0
Ethyl methacrylate	0.2	0.162	-	19	20	91	0
1,1,2-Trichloroethane	0.156	0.154*	-	1.3	20	109	0
Chlorodibromomethane	40	45.453	-	-13.6	20	123	0
1,3-Dichloropropane	0.301	0.299	-	0.7	20	107	-.01
1,2-Dibromoethane	0.181	0.189*	-	-4.4	20	109	0
2-Hexanone	0.088	0.067	-	23.9*	20	88	0
Chlorobenzene	0.788	0.829	-	-5.2	20	119	0
Ethylbenzene	1.324	1.332	-	-0.6	20	117	0
1,1,1,2-Tetrachloroethane	0.279	0.327	-	-17.2	20	125	0
p/m Xylene	0.527	0.556	-	-5.5	20	119	0
o Xylene	80	75.076	-	6.2	20	114	0
Styrene	80	80.584	-	-0.7	20	111	0
1,4-Dichlorobenzene-d4	1	1	-	0	20	110	0
Bromoform	40	39.382	-	1.5	20	123	0
Isopropylbenzene	2.363	2.415	-	-2.2	20	117	0
4-Bromofluorobenzene	0.695	0.701	-	-0.9	20	109	0
Bromobenzene	0.586	0.621	-	-6	20	119	0
n-Propylbenzene	2.769	2.773	-	-0.1	20	115	0
1,4-Dichlorobutane	0.449	0.409	-	8.9	20	103	0
1,1,2,2-Tetrachloroethane	0.391	0.37	-	5.4	20	102	0
4-Ethyltoluene	2.339	2.437	-	-4.2	20	118	0
2-Chlorotoluene	1.526	1.552	-	-1.7	20	116	0
1,3,5-Trimethylbenzene	2.032	2.07	-	-1.9	20	115	0
1,2,3-Trichloropropane	0.306	0.277	-	9.5	20	103	0
trans-1,4-Dichloro-2-buten	0.093	0.088	-	5.4	20	104	0
4-Chlorotoluene	1.582	1.613	-	-2	20	113	0
tert-Butylbenzene	1.851	1.927	-	-4.1	20	120	0
1,2,4-Trimethylbenzene	1.988	2.02	-	-1.6	20	113	0
sec-Butylbenzene	2.76	2.795	-	-1.3	20	116	0
p-Isopropyltoluene	2.415	2.539	-	-5.1	20	118	0
1,3-Dichlorobenzene	1.236	1.326	-	-7.3	20	120	0
1,4-Dichlorobenzene	1.258	1.321	-	-5	20	120	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: CDM Smith, Inc.		**Lab Number**	: L2406353	
Project Name	: LEDGE RD LANDFILL		**Project Number**	: 289302	
Instrument ID	: VOA117		**Calibration Date**	: 02/07/24 09:29	
Lab File ID	: V17240207B01		**Init. Calib. Date(s)**	: 12/14/23	12/14/23
Sample No	: WG1882758-2		**Init. Calib. Times**	: 14:50	19:41
Channel	:				

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
p-Diethylbenzene	1.509	1.568	-	-3.9	20	120	0
n-Butylbenzene	2.062	2.114	-	-2.5	20	114	0
1,2-Dichlorobenzene	1.131	1.199	-	-6	20	118	0
1,2,4,5-Tetramethylbenzene	2.281	2.338	-	-2.5	20	116	0
1,2-Dibromo-3-chloropropan	0.066	0.068	-	-3	20	114	0
1,3,5-Trichlorobenzene	0.889	1.032	-	-16.1	20	127	0
Hexachlorobutadiene	0.405	0.455	-	-12.3	20	131	0
1,2,4-Trichlorobenzene	0.744	0.83	-	-11.6	20	123	0
Naphthalene	1.575	1.504	-	4.5	20	109	0
1,2,3-Trichlorobenzene	0.661	0.73	-	-10.4	20	122	0

*** Value outside of QC limits.**

ANALYTICAL REPORT

Lab Number:	L2408857
Client:	CDM Smith, Inc. 75 State Street Suite 701 Boston, MA 02109
ATTN:	Nathan Jones
Phone:	(617) 452-6563
Project Name:	LEDGE RD LANDFILL
Project Number:	289302
Report Date:	02/23/24

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA030), NH NELAP (2062), CT (PH-0825), DoD (L2474), FL (E87814), IL (200081), IN (C-MA-04), KY (KY98046), LA (85084), ME (MA00030), MD (350), MI (99110) , NJ (MA015), NY (11627), NC (685), OH (CL106), OR (MA-0262), PA (68-02089), RI (LAO00299), TX (T104704419), VT (VT-0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #525-23-107-88708), USFWS (Permit #206964).

320 Forbes Boulevard, Mansfield, MA 02048-1806
508-822-9300 (Fax) 508-822-3288 800-624-9220 - www.alphalab.com

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2408857
Report Date: 02/23/24

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2408857-01	WRA-2	SOIL	ANDOVER, MA	02/05/24 09:55	02/06/24

Project Name: LEDGE RD LANDFILL **Lab Number:** L2408857

Project Number: 289302 **Report Date:** 02/23/24

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	YES
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	YES

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2408857
Project Number:	289302	**Report Date:**	02/23/24

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2408857
Project Number:	289302	**Report Date:**	02/23/24

Case Narrative (continued)

MCP Related Narratives

Report Submission

All MCP required questions were answered with affirmative responses; therefore, there are no relevant protocol-specific QC and/or performance standard non-conformances to report.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Kelly O'Neill

Title: Technical Director/Representative Date: 02/23/24

QC OUTLIER SUMMARY REPORT

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2408857
Report Date: 02/23/24

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment

There are no QC Outliers associated with this report.

ORGANICS

SEMIVOLATILES

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2408857
Report Date: 02/23/24

SAMPLE RESULTS

Lab ID: L2408857-01
Client ID: WRA-2
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 09:55
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8270E-SIM
Analytical Date: 02/20/24 15:38
Analyst: AMV
Percent Solids: 86%

Extraction Method: EPA 3570
Extraction Date: 02/19/24 22:26

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP 1,4 Dioxane by 8270E-SIM - Mansfield Lab						
1,4-Dioxane	ND		ug/kg	8.00	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,4-Dioxane-d8	84		15-110

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2408857
Report Date: 02/23/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E-SIM
Analytical Date: 02/20/24 13:14
Analyst: AMV

Extraction Method: EPA 3570
Extraction Date: 02/19/24 22:26

Parameter	Result	Qualifier	Units	RL	MDL
MCP 1,4 Dioxane by 8270E-SIM - Mansfield Lab for sample(s): 01 Batch: WG1886907-1					
1,4-Dioxane	ND		ug/kg	8.00	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,4-Dioxane-d8	81		15-110

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2408857

Report Date: 02/23/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP 1,4 Dioxane by 8270E-SIM - Mansfield Lab Associated sample(s): 01 Batch: WG1886907-2 WG1886907-3								
1,4-Dioxane	107		107		40-140	0		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,4-Dioxane-d8	81		82		15-110

INORGANICS
&
MISCELLANEOUS

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2408857
Report Date: 02/23/24

SAMPLE RESULTS

Lab ID: L2408857-01
Client ID: WRA-2
Sample Location: ANDOVER, MA

Date Collected: 02/05/24 09:55
Date Received: 02/06/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	86.3		%	0.100	--	1	-	02/06/24 21:52	121,2540G	SJB

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2408857
Report Date: 02/23/24

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2408857-01A	Glass 60mL/2oz unpreserved	A	NA		4.3	Y	Absent		A2-MCP-14DX-SIM-21(14)

*Values in parentheses indicate holding time in days

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2408857
Project Number:	289302	**Report Date:**	02/23/24

GLOSSARY

Acronyms

DL - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EMPC - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LOD - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

LOQ - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

NR - No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TEF - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.

TEQ - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2408857
Project Number:	289302	**Report Date:**	02/23/24

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2408857
Project Number:	289302	**Report Date:**	02/23/24

Data Qualifiers

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2408857
Project Number:	289302	**Report Date:**	02/23/24

REFERENCES

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

141 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA and IIB, November 2021.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 2/16/24

ALPHA Job #: ~~L2406393~~

ALPHA Analytical
8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220
320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Project Information
Project Name: Ledge Rd Landfill
Project Location: Andover, MA
Project #: 289362
Project Manager: Nathan Jones
ALPHA Quote #:

Report Information - Data Deliverables
☑ ADEx ☐ EMAIL

Billing Information
☑ Same as Client Info PO #:

Client Information
Client: CDM Smith
Address: 75 State Street, Suite 701
Boston, MA 02109
Phone: 617-452-6563
Email: JonesNA2@cdmsmith.com

Regulatory Requirements & Project Information Requirements
☑ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods
☐ Yes ☑ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☑ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☑ No NPDES RGP
☐ Other State /Fed Program ____ Criteria ____

Turn-Around Time
☐ Standard ☑ RUSH (only confirmed if pre-approved)
Date Due:

Additional Project Information:
Detection limits for each parameter shall be less than reportable concentrations for RCS-1 criteria

ANALYSIS: VOC: ☑ 8260 ☐ 624 ☐ 524.2; SVOC: ☐ 8270 ☐ PAH; METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15; METALS: ☐ RCRA8 ☐ RCRA9 ☐ PP13; EPH: ☐ Ranges & Targets ☐ Ranges Only; VPH: ☐ Ranges & Targets ☐ Ranges Only; & PCB ☐ WEST; TOX: ☐ Cl Only ☐ Br Only ☐ Cl+Br only; EPA 8081; TPH - MassDEP; PAHs - EPA 8270

SAMPLE INFO: Filtration ☐ Field ☐ Lab to do; Preservation ☐ Lab to do

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	VOC	SVOC	METALS	TPH	PAHs	Sample Comments
08857 ~~W0363~~ 01	WRA-2	2/15/24	0955	Soil	ET	X	X		X	X	1,4-Dioxane SIM
~~02~~	~~WRA-1-S-2~~		1135				X				
~~03~~	~~WRA-1-S-1~~		1145				X				
~~04~~	~~WRA-1-N-5~~		1155				X				
~~05~~	~~WRA-1-N-4~~		1310				X				
~~06~~	~~WRA-1-N-3~~		1345				X				
~~07~~	~~WRA-1-N-2~~		1410				X				
~~08~~	~~WRA-1-N-1~~		1426				X				
~~09~~	~~WRA-1-S-5~~		1440				X				
~~10~~	~~WRA-1-S-3~~		1540				X				
~~11~~	~~WRA-1-S-4~~		1550				X				

Container Type / Preservative

Container Type: P= Plastic, A= Amber glass, V= Vial, G= Glass, B= Bacteria cup, C= Cube, O= Other, E= Encore, D= BOD Bottle

Preservative: A= None, B= HCl, C= HNO_3, D= H_2SO_4, E= NaOH, F= MeOH, G= $NaHSO_4$, H= NaS_2O_3, I= Ascorbic Acid, J= NH_4Cl, K= Zn Acetate, O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	11:21 2/16/24	[signature] DAUGHAL	2-16-24 11:21
[signature] DAUGHAL	2-16-24 14:50	[signature]	2/16/24 14:50

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

ANALYTICAL REPORT

Lab Number:	L2411876
Client:	CDM Smith, Inc. 75 State Street Suite 701 Boston, MA 02109
ATTN:	Nathan Jones
Phone:	(617) 452-6563
Project Name:	LEDGE RD LANDFILL
Project Number:	289302
Report Date:	03/06/24

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2411876
Report Date: 03/06/24

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2411876-01	WE-1-SW-1	SOIL	ANDOVER, MA	03/04/24 15:45	03/05/24
L2411876-02	WE-1-SW-2	SOIL	ANDOVER, MA	03/04/24 15:45	03/05/24
L2411876-03	WE-1-SW-3	SOIL	ANDOVER, MA	03/04/24 15:45	03/05/24
L2411876-04	WE-1-B-1	SOIL	ANDOVER, MA	03/05/24 09:20	03/05/24
L2411876-05	DUPE-1	SOIL	ANDOVER, MA	03/05/24 00:00	03/05/24
L2411876-06	WE-2-SW-1	SOIL	ANDOVER, MA	03/05/24 09:55	03/05/24
L2411876-07	WE-2-SW-2	SOIL	ANDOVER, MA	03/05/24 10:00	03/05/24
L2411876-08	WE-2-SW-3	SOIL	ANDOVER, MA	03/05/24 10:05	03/05/24
L2411876-09	WE-2-SW-4	SOIL	ANDOVER, MA	03/05/24 10:10	03/05/24
L2411876-10	WE-2-SW-5	SOIL	ANDOVER, MA	03/05/24 10:15	03/05/24
L2411876-11	WE-2-SW-6	SOIL	ANDOVER, MA	03/05/24 10:25	03/05/24
L2411876-12	WE-2-B-1	SOIL	ANDOVER, MA	03/05/24 10:20	03/05/24
L2411876-13	WE-3-SW-1	SOIL	ANDOVER, MA	03/05/24 13:45	03/05/24
L2411876-14	WE-3-SW-2	SOIL	ANDOVER, MA	03/05/24 13:50	03/05/24
L2411876-15	WE-3-SW-3	SOIL	ANDOVER, MA	03/05/24 13:55	03/05/24
L2411876-16	DUPE-3	SOIL	ANDOVER, MA	03/05/24 00:00	03/05/24
L2411876-17	WE-3-SW-4	SOIL	ANDOVER, MA	03/05/24 14:00	03/05/24
L2411876-18	WE-3-B-1	SOIL	ANDOVER, MA	03/05/24 13:25	03/05/24
L2411876-19	WE-3-B-2	SOIL	ANDOVER, MA	03/05/24 13:30	03/05/24
L2411876-20	DUPE-2	SOIL	ANDOVER, MA	03/05/24 00:00	03/05/24

Project Name: LEDGE RD LANDFILL **Lab Number:** L2411876

Project Number: 289302 **Report Date:** 03/06/24

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	NO

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2411876
Project Number:	289302	**Report Date:**	03/06/24

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2411876
Project Number:	289302	**Report Date:**	03/06/24

Case Narrative (continued)

MCP Related Narratives

Total Metals

L2411876-01 through -20: The sample has an elevated detection limit due to the dilution required by the sample matrix.

In reference to question H:

The WG1892597-5 MSD recovery, performed on L2411876-17, is outside the acceptance criteria for arsenic (51%). Re-analysis of the MSD yielded an unacceptable recovery for arsenic in the range of 30-74% or >125%. The LCS recovery is acceptable; therefore, no further action was taken.

In reference to question I:

All samples were analyzed for a subset of MCP analytes per client request.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Kelly Stenstrom

Title: Technical Director/Representative Date: 03/06/24

QC OUTLIER SUMMARY REPORT

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2411876
Report Date: 03/06/24

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment
MCP Total Metals - Mansfield Lab								
6010D	Batch QC (L2411876-17)	WG1892597-5	Arsenic, Total	MSD	51	75-125	01-20	potential low bias

METALS

Project Name: LEDGE RD LANDFILL
Lab Number: L2411876
Project Number: 289302
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-01
Client ID: WE-1-SW-1
Sample Location: ANDOVER, MA
Date Collected: 03/04/24 15:45
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 58%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	4.72		mg/kg	3.38	--	5	03/06/24 08:00	03/06/24 11:18	EPA 3050B	97,6010D	MRC

Project Name: LEDGE RD LANDFILL
Lab Number: L2411876
Project Number: 289302
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-02
Client ID: WE-1-SW-2
Sample Location: ANDOVER, MA
Date Collected: 03/04/24 15:45
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 11%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	67.2		mg/kg	17.6	--	5	03/06/24 08:00	03/06/24 11:22	EPA 3050B	97,6010D	MRC

Project Name: LEDGE RD LANDFILL
Lab Number: L2411876
Project Number: 289302
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-03
Client ID: WE-1-SW-3
Sample Location: ANDOVER, MA
Date Collected: 03/04/24 15:45
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 10%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	138		mg/kg	20.2	--	5	03/06/24 08:00	03/06/24 11:57	EPA 3050B	97,6010D	MRC

Project Name: LEDGE RD LANDFILL
Lab Number: L2411876
Project Number: 289302
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-04
Client ID: WE-1-B-1
Sample Location: ANDOVER, MA
Date Collected: 03/05/24 09:20
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 31%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	43.3		mg/kg	6.43	--	5	03/06/24 08:00	03/06/24 12:01	EPA 3050B	97,6010D	MRC

Project Name: LEDGE RD LANDFILL
Lab Number: L2411876
Project Number: 289302
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-05
Client ID: DUPE-1
Sample Location: ANDOVER, MA
Date Collected: 03/05/24 00:00
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 53%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	45.3		mg/kg	3.68	--	5	03/06/24 08:00	03/06/24 12:05	EPA 3050B	97,6010D	MRC

Project Name: LEDGE RD LANDFILL
Lab Number: L2411876
Project Number: 289302
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-06
Client ID: WE-2-SW-1
Sample Location: ANDOVER, MA
Date Collected: 03/05/24 09:55
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 45%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	13.6		mg/kg	4.28	--	5	03/06/24 08:00	03/06/24 12:09	EPA 3050B	97,6010D	MRC

Project Name: LEDGE RD LANDFILL
Lab Number: L2411876
Project Number: 289302
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-07
Client ID: WE-2-SW-2
Sample Location: ANDOVER, MA
Date Collected: 03/05/24 10:00
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 33%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	219		mg/kg	22.8	--	20	03/06/24 08:00	03/06/24 13:56	EPA 3050B	97,6010D	MRC

Project Name: LEDGE RD LANDFILL
Lab Number: L2411876
Project Number: 289302
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-08
Client ID: WE-2-SW-3
Sample Location: ANDOVER, MA
Date Collected: 03/05/24 10:05
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 14%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	45.9		mg/kg	13.7	--	5	03/06/24 08:00	03/06/24 12:18	EPA 3050B	97,6010D	MRC

Project Name: LEDGE RD LANDFILL
Lab Number: L2411876
Project Number: 289302
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-09
Client ID: WE-2-SW-4
Sample Location: ANDOVER, MA
Date Collected: 03/05/24 10:10
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 57%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	15.7		mg/kg	3.38	--	5	03/06/24 08:00	03/06/24 12:22	EPA 3050B	97,6010D	MRC

Project Name: LEDGE RD LANDFILL
Lab Number: L2411876
Project Number: 289302
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-10
Client ID: WE-2-SW-5
Sample Location: ANDOVER, MA
Date Collected: 03/05/24 10:15
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 33%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	66.4		mg/kg	11.7	--	10	03/06/24 08:00	03/06/24 13:45	EPA 3050B	97,6010D	MRC

Project Name: LEDGE RD LANDFILL
Lab Number: L2411876
Project Number: 289302
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-11
Client ID: WE-2-SW-6
Sample Location: ANDOVER, MA
Date Collected: 03/05/24 10:25
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 35%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	20.8		mg/kg	11.0	--	10	03/06/24 08:00	03/06/24 13:49	EPA 3050B	97,6010D	MRC

Project Name: LEDGE RD LANDFILL
Lab Number: L2411876
Project Number: 289302
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-12
Client ID: WE-2-B-1
Sample Location: ANDOVER, MA
Date Collected: 03/05/24 10:20
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 30%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	45.4		mg/kg	6.41	--	5	03/06/24 08:00	03/06/24 12:35	EPA 3050B	97,6010D	MRC

Project Name: LEDGE RD LANDFILL
Lab Number: L2411876
Project Number: 289302
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-13
Client ID: WE-3-SW-1
Sample Location: ANDOVER, MA
Date Collected: 03/05/24 13:45
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 18%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	46.6		mg/kg	10.9	--	5	03/06/24 08:00	03/06/24 13:02	EPA 3050B	97,6010D	MRC

Project Name: LEDGE RD LANDFILL
Lab Number: L2411876
Project Number: 289302
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-14
Client ID: WE-3-SW-2
Sample Location: ANDOVER, MA
Date Collected: 03/05/24 13:50
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 12%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	182		mg/kg	16.7	--	5	03/06/24 08:00	03/06/24 13:07	EPA 3050B	97,6010D	MRC

Project Name: LEDGE RD LANDFILL
Lab Number: L2411876
Project Number: 289302
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-15
Client ID: WE-3-SW-3
Sample Location: ANDOVER, MA
Date Collected: 03/05/24 13:55
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 14%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	49.5		mg/kg	14.2	--	5	03/06/24 08:00	03/06/24 13:11	EPA 3050B	97,6010D	MRC

Project Name: LEDGE RD LANDFILL
Lab Number: L2411876
Project Number: 289302
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-16
Client ID: DUPE-3
Sample Location: ANDOVER, MA
Date Collected: 03/05/24 00:00
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 12%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	39.6		mg/kg	15.3	--	5	03/06/24 08:00	03/06/24 13:15	EPA 3050B	97,6010D	MRC

Project Name: LEDGE RD LANDFILL
Lab Number: L2411876
Project Number: 289302
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-17
Client ID: WE-3-SW-4
Sample Location: ANDOVER, MA
Date Collected: 03/05/24 14:00
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 30%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	80.8		mg/kg	6.55	--	5	03/06/24 08:00	03/06/24 11:27	EPA 3050B	97,6010D	MRC

Project Name: LEDGE RD LANDFILL
Lab Number: L2411876
Project Number: 289302
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-18
Client ID: WE-3-B-1
Sample Location: ANDOVER, MA
Date Collected: 03/05/24 13:25
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 30%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	42.6		mg/kg	6.63	--	5	03/06/24 08:00	03/06/24 13:19	EPA 3050B	97,6010D	MRC

Project Name: LEDGE RD LANDFILL
Lab Number: L2411876
Project Number: 289302
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-19
Client ID: WE-3-B-2
Sample Location: ANDOVER, MA
Date Collected: 03/05/24 13:30
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 64%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	130		mg/kg	3.03	--	5	03/06/24 08:00	03/06/24 13:24	EPA 3050B	97,6010D	MRC

Project Name: LEDGE RD LANDFILL
Lab Number: L2411876
Project Number: 289302
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-20
Client ID: DUPE-2
Sample Location: ANDOVER, MA
Date Collected: 03/05/24 00:00
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 37%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	40.9		mg/kg	5.30	--	5	03/06/24 08:00	03/06/24 13:28	EPA 3050B	97,6010D	MRC

Project Name: LEDGE RD LANDFILL **Lab Number:** L2411876

Project Number: 289302 **Report Date:** 03/06/24

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-20 Batch: WG1892597-1										
Arsenic, Total	ND		mg/kg	0.400	--	1	03/06/24 08:00	03/06/24 11:05	97,6010D	MRC

Prep Information

Digestion Method: EPA 3050B

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2411876

Report Date: 03/06/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-20 Batch: WG1892597-2 WG1892597-3 SRM Lot Number: D123-540								
Arsenic, Total	100		104		82-118	4		30

Matrix Spike Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2411876
Report Date: 03/06/24

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-20 QC Batch ID: WG1892597-4 WG1892597-5 QC Sample: L2411876-17 Client ID: WE-3-SW-4												
Arsenic, Total	80.8	30.3	109	93		96.5	**51**	Q	75-125	12		35

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Serial Dilution Analysis
Batch Quality Control

Lab Number: L2411876
Report Date: 03/06/24

Parameter	Native Sample	Serial Dilution	Units	% D	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-20 QC Batch ID: WG1892597-7 QC Sample: L2411876-17 Client ID: WE-3-SW-4						
Arsenic, Total	80.8	71.8	mg/kg	11		20

INORGANICS
&
MISCELLANEOUS

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2411876
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-01
Client ID: WE-1-SW-1
Sample Location: ANDOVER, MA

Date Collected: 03/04/24 15:45
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	58.2		%	0.100	NA	1	-	03/05/24 21:11	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2411876
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-02
Client ID: WE-1-SW-2
Sample Location: ANDOVER, MA

Date Collected: 03/04/24 15:45
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	10.9		%	0.100	NA	1	-	03/05/24 21:11	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2411876
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-03
Client ID: WE-1-SW-3
Sample Location: ANDOVER, MA

Date Collected: 03/04/24 15:45
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	9.63		%	0.100	NA	1	-	03/05/24 21:11	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2411876
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-04
Client ID: WE-1-B-1
Sample Location: ANDOVER, MA

Date Collected: 03/05/24 09:20
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	30.6		%	0.100	NA	1	-	03/05/24 21:11	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2411876
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-05
Client ID: DUPE-1
Sample Location: ANDOVER, MA

Date Collected: 03/05/24 00:00
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	53.1		%	0.100	NA	1	-	03/05/24 21:11	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2411876
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-06
Client ID: WE-2-SW-1
Sample Location: ANDOVER, MA

Date Collected: 03/05/24 09:55
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	44.8		%	0.100	NA	1	-	03/05/24 21:11	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2411876
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-07
Client ID: WE-2-SW-2
Sample Location: ANDOVER, MA

Date Collected: 03/05/24 10:00
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	33.4		%	0.100	NA	1	-	03/05/24 21:11	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2411876
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-08
Client ID: WE-2-SW-3
Sample Location: ANDOVER, MA

Date Collected: 03/05/24 10:05
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	14.0		%	0.100	NA	1	-	03/05/24 21:11	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2411876
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-09
Client ID: WE-2-SW-4
Sample Location: ANDOVER, MA

Date Collected: 03/05/24 10:10
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	57.2		%	0.100	NA	1	-	03/05/24 21:11	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2411876
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-10
Client ID: WE-2-SW-5
Sample Location: ANDOVER, MA

Date Collected: 03/05/24 10:15
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	33.4		%	0.100	NA	1	-	03/05/24 21:11	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2411876
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-11
Client ID: WE-2-SW-6
Sample Location: ANDOVER, MA

Date Collected: 03/05/24 10:25
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	34.9		%	0.100	NA	1	-	03/05/24 21:11	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2411876
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-12
Client ID: WE-2-B-1
Sample Location: ANDOVER, MA

Date Collected: 03/05/24 10:20
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	29.5		%	0.100	NA	1	-	03/05/24 21:11	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2411876
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-13
Client ID: WE-3-SW-1
Sample Location: ANDOVER, MA

Date Collected: 03/05/24 13:45
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	17.5		%	0.100	NA	1	-	03/05/24 21:11	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2411876
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-14
Client ID: WE-3-SW-2
Sample Location: ANDOVER, MA

Date Collected: 03/05/24 13:50
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	11.5		%	0.100	NA	1	-	03/05/24 21:11	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2411876
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-15
Client ID: WE-3-SW-3
Sample Location: ANDOVER, MA

Date Collected: 03/05/24 13:55
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	13.6		%	0.100	NA	1	-	03/05/24 21:11	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2411876
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-16
Client ID: DUPE-3
Sample Location: ANDOVER, MA

Date Collected: 03/05/24 00:00
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	12.4		%	0.100	NA	1	-	03/05/24 21:11	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2411876
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-17
Client ID: WE-3-SW-4
Sample Location: ANDOVER, MA

Date Collected: 03/05/24 14:00
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	30.0		%	0.100	NA	1	-	03/05/24 21:11	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2411876
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-18
Client ID: WE-3-B-1
Sample Location: ANDOVER, MA

Date Collected: 03/05/24 13:25
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	29.6		%	0.100	NA	1	-	03/05/24 21:11	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2411876
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-19
Client ID: WE-3-B-2
Sample Location: ANDOVER, MA

Date Collected: 03/05/24 13:30
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	63.9		%	0.100	NA	1	-	03/05/24 21:11	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2411876
Report Date: 03/06/24

SAMPLE RESULTS

Lab ID: L2411876-20
Client ID: DUPE-2
Sample Location: ANDOVER, MA

Date Collected: 03/05/24 00:00
Date Received: 03/05/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	36.6		%	0.100	NA	1	-	03/05/24 21:11	121,2540G	WJM

Lab Duplicate Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2411876

Report Date: 03/06/24

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-20 QC Batch ID: WG1892555-1 QC Sample: L2411876-17 Client ID: WE-3-SW-4						
Solids, Total	30.0	28.4	%	5		20

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2411876
Report Date: 03/06/24

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2411876-01A	Plastic 2oz unpreserved for TS	A	NA		4.9	Y	Absent		TS(7)
L2411876-01B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.9	Y	Absent		MCP-AS-6010T-10(180)
L2411876-02A	Plastic 2oz unpreserved for TS	A	NA		4.9	Y	Absent		TS(7)
L2411876-02B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.9	Y	Absent		MCP-AS-6010T-10(180)
L2411876-03A	Plastic 2oz unpreserved for TS	A	NA		4.9	Y	Absent		TS(7)
L2411876-03B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.9	Y	Absent		MCP-AS-6010T-10(180)
L2411876-04A	Plastic 2oz unpreserved for TS	A	NA		4.9	Y	Absent		TS(7)
L2411876-04B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.9	Y	Absent		MCP-AS-6010T-10(180)
L2411876-05A	Plastic 2oz unpreserved for TS	A	NA		4.9	Y	Absent		TS(7)
L2411876-05B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.9	Y	Absent		MCP-AS-6010T-10(180)
L2411876-06A	Plastic 2oz unpreserved for TS	A	NA		4.9	Y	Absent		TS(7)
L2411876-06B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.9	Y	Absent		MCP-AS-6010T-10(180)
L2411876-07A	Plastic 2oz unpreserved for TS	A	NA		4.9	Y	Absent		TS(7)
L2411876-07B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.9	Y	Absent		MCP-AS-6010T-10(180)
L2411876-08A	Plastic 2oz unpreserved for TS	A	NA		4.9	Y	Absent		TS(7)
L2411876-08B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.9	Y	Absent		MCP-AS-6010T-10(180)
L2411876-09A	Plastic 2oz unpreserved for TS	A	NA		4.9	Y	Absent		TS(7)
L2411876-09B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.9	Y	Absent		MCP-AS-6010T-10(180)
L2411876-10A	Plastic 2oz unpreserved for TS	A	NA		4.9	Y	Absent		TS(7)
L2411876-10B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.9	Y	Absent		MCP-AS-6010T-10(180)
L2411876-11A	Plastic 2oz unpreserved for TS	A	NA		4.9	Y	Absent		TS(7)
L2411876-11B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.9	Y	Absent		MCP-AS-6010T-10(180)
L2411876-12A	Plastic 2oz unpreserved for TS	A	NA		4.9	Y	Absent		TS(7)

*Values in parentheses indicate holding time in days

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2411876
Report Date: 03/06/24

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2411876-12B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.9	Y	Absent		MCP-AS-6010T-10(180)
L2411876-13A	Plastic 2oz unpreserved for TS	A	NA		4.9	Y	Absent		TS(7)
L2411876-13B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.9	Y	Absent		MCP-AS-6010T-10(180)
L2411876-14A	Plastic 2oz unpreserved for TS	A	NA		4.9	Y	Absent		TS(7)
L2411876-14B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.9	Y	Absent		MCP-AS-6010T-10(180)
L2411876-15A	Plastic 2oz unpreserved for TS	A	NA		4.9	Y	Absent		TS(7)
L2411876-15B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.9	Y	Absent		MCP-AS-6010T-10(180)
L2411876-16A	Plastic 2oz unpreserved for TS	A	NA		4.9	Y	Absent		TS(7)
L2411876-16B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.9	Y	Absent		MCP-AS-6010T-10(180)
L2411876-17A	Plastic 2oz unpreserved for TS	A	NA		4.9	Y	Absent		TS(7)
L2411876-17A1	Plastic 2oz unpreserved for TS	A	NA		4.9	Y	Absent		TS(7)
L2411876-17A2	Plastic 2oz unpreserved for TS	A	NA		4.9	Y	Absent		TS(7)
L2411876-17B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.9	Y	Absent		MCP-AS-6010T-10(180)
L2411876-17B1	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.9	Y	Absent		MCP-AS-6010T-10(180)
L2411876-17B2	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.9	Y	Absent		MCP-AS-6010T-10(180)
L2411876-18A	Plastic 2oz unpreserved for TS	A	NA		4.9	Y	Absent		TS(7)
L2411876-18B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.9	Y	Absent		MCP-AS-6010T-10(180)
L2411876-19A	Plastic 2oz unpreserved for TS	A	NA		4.9	Y	Absent		TS(7)
L2411876-19B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.9	Y	Absent		MCP-AS-6010T-10(180)
L2411876-20A	Plastic 2oz unpreserved for TS	A	NA		4.9	Y	Absent		TS(7)
L2411876-20B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.9	Y	Absent		MCP-AS-6010T-10(180)

*Values in parentheses indicate holding time in days

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2411876
Project Number:	289302	**Report Date:**	03/06/24

GLOSSARY

Acronyms

DL - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EMPC - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LOD - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

LOQ - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

NR - No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TEF - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.

TEQ - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2411876
Project Number:	289302	**Report Date:**	03/06/24

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2411876
Project Number:	289302	**Report Date:**	03/06/24

Data Qualifiers

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: Data Usability Report

REFERENCES

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010; WSC-CAM-IIIA and IIID, January 2024; and WSC-CAM-IIIB and VA, February 2024.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 3

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 3/5/24

ALPHA Job #: L2411876

Client Information

Client: CDM Smith
Address: 75 State Street, Suite 701
Boston, MA 02109
Phone: 617-452-6563
Fax:
Email: JonesNE@cdmsmith.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Ledge Rd Landfill
Project Location: Andover, MA
Project #: 289302
Project Manager: Nathan Jones
ALPHA Quote #:

Turn-Around Time

☐ Standard ☒ RUSH (only confirmed if pre-approved)
Date Due: Time: 1 day

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program: MassDEP Criteria: RCS-1 Soil Standards

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

☒ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☒ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

include petersoncr@cdmsmith on all emails

ANALYSIS: Total Arsenic

SAMPLE HANDLING
Filtration
☐ Done
☒ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

TOTAL # BOTTLES

Sample Specific Comments

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	Total Arsenic	Sample Specific Comments	TOTAL # BOTTLES
11876-01	WE-1-SW-1	3/4/24	15:45	SO	CP/KC	X		
02	WE-1-SW-2	3/4/24	15:45	SO				
03	WE-1-SW-3	3/4/24	15:45					
04	WE-1-D-1	3/5/24	09:20					
05	Dupe-1	3/5/24	—					
06	WE-2-SW-1	3/5/24	09:55					
07	WE-2-SW-2	3/5/24	10:00					
08	WE-2-SW-3	3/5/24	10:05					
09	WE-2-SW-4	3/5/24	10:10					
10	WE-2-SW-5	3/5/24	10:15	↓	↓	↓		

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP *or* CT RCP?

Container Type
Preservative

Relinquished By:	Date/Time	Received By:	Date/Time
	3/5/24 16:00		3/5/24 1600
	3/5/24 1930		3/5/24 1930

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 18-Jan-2010)

CHAIN OF CUSTODY

PAGE 2 OF 3

Date Rec'd in Lab: 3/5/24

ALPHA Job #: L2411876

ALPHA
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: CDM Smith
Address: 75 State Street, Suite 701
Boston, MA 02109
Phone: 617-452-6563
Fax:
Email: JonesNE@cdmsmith.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Ledge Rd Landfill
Project Location: Andover, MA
Project #: 289302
Project Manager: Nathan Jones
ALPHA Quote #:

Turn-Around Time

☐ Standard ☒ RUSH (only confirmed if pre-approved)
Date Due: Time: 1 day

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client Info PO #:

Regulatory Requirements/Report Limits

State /Fed Program: MassDEP Criteria: RCS-1 Soil Standards

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

☒ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☒ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

Run MS/MSD for WE-3-SW-4

include petersoncr@cdmsmith on all emails

ANALYSIS: Total Arsenic

SAMPLE HANDLING
Filtration
☐ Done
☒ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

TOTAL # BOTTLES

Sample Specific Comments

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	Total Arsenic	Sample Specific Comments	TOTAL # BOTTLES
11476-11	WE-2-SW-6	3/5/24	10:25	SO	CP/MG	X		
12	WE-2-B-1	3/5/24	10:20	SO				
13	WE-3-SW-1		13:45					
14	WE-3-SW-2		13:50					
15	WE-3-SW-3		13:55					
16	Dupe-3		—					
17	WE-3-SW-4		14:00					
	WE-3-SW-4-MS		14:00					
	WE-3-SW-4-MSD		14:00					
18	WE-3-B-1		13:25					

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP *or* CT RCP?

Container Type
Preservative

Relinquished By:	Date/Time	Received By:	Date/Time
	3/5/24 11:00		3/5/24 16:00
	3/5/24 1730		3/5/24 1730

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 19-Jan-2010)

CHAIN OF CUSTODY

PAGE 3 OF 3

Date Rec'd In Lab: 3/5/24

ALPHA Job #: L2411876

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: CDM Smith
Address: 75 State Street, Suite 701
Boston, MA 02109
Phone: 617-452-6563
Fax:
Email: JonesNE@cdmsmith.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Ledge Rd Landfill
Project Location: Andover, MA
Project #: 289302
Project Manager: Nathan Jones
ALPHA Quote #:

Turn-Around Time

☐ Standard ☒ RUSH (only confirmed if pre-approved)
Date Due: Time: 1 day

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client Info PO #:

Regulatory Requirements/Report Limits

State /Fed Program: MassDEP Criteria: RCS-1 Soil Standards

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

☒ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☒ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

include petersoncr@cdmsmith on all emails

ANALYSIS: Total Arsenic

SAMPLE HANDLING
Filtration
☐ Done
☒ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

Sample Specific Comments

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	Total Arsenic	Total # Bottles
11876 - 19	WE-3-B-2	3/5/24	13:30	SO		X	
20	Dupe-2	3/5/24	—	SO		X	

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP *or* CT RCP?

	Container Type																					
	Preservative																					

Relinquished By:	Date/Time	Received By:	Date/Time
	3/5/24 16:00		3/5/24 1600
	3/5/24 1930		3/5/24 1930

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 18-Jan-2010)

ANALYTICAL REPORT

Lab Number:	L2413165
Client:	CDM Smith, Inc. 75 State Street Suite 701 Boston, MA 02109
ATTN:	Nathan Jones
Phone:	(617) 452-6563
Project Name:	LEDGE RD LANDFILL
Project Number:	289302
Report Date:	03/12/24

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2413165
Report Date: 03/12/24

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2413165-01	WE-3-SW-5	SOIL	ANDOVER, MA	03/11/24 10:50	03/11/24
L2413165-02	WE-3-SW-6	SOIL	ANDOVER, MA	03/11/24 10:55	03/11/24
L2413165-03	WE-3-SW-7	SOIL	ANDOVER, MA	03/11/24 11:00	03/11/24
L2413165-04	WE-3-SW-8	SOIL	ANDOVER, MA	03/11/24 11:05	03/11/24
L2413165-05	WE-3-SW-9	SOIL	ANDOVER, MA	03/11/24 11:10	03/11/24
L2413165-06	WE-3-SW-10	SOIL	ANDOVER, MA	03/11/24 11:15	03/11/24
L2413165-07	WE-3-SW-11	SOIL	ANDOVER, MA	03/11/24 11:20	03/11/24
L2413165-08	WE-3-B-3	SOIL	ANDOVER, MA	03/11/24 12:30	03/11/24
L2413165-09	WE-3-B-4	SOIL	ANDOVER, MA	03/11/24 12:35	03/11/24

Project Name: LEDGE RD LANDFILL **Lab Number:** L2413165

Project Number: 289302 **Report Date:** 03/12/24

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	NO

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2413165
Project Number:	289302	**Report Date:**	03/12/24

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2413165
Project Number:	289302	**Report Date:**	03/12/24

Case Narrative (continued)

MCP Related Narratives

Sample Receipt

In reference to question H:

A Matrix Spike was not submitted for the analysis of Total Metals.

Total Metals

L2413165-01 through 09: The sample has an elevated detection limit due to the dilution required by the sample matrix.

In reference to question I:

All samples were analyzed for a subset of MCP analytes per client request.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Michelle M. Morris

Title: Technical Director/Representative Date: 03/12/24

QC OUTLIER SUMMARY REPORT

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2413165
Report Date: 03/12/24

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment

There are no QC Outliers associated with this report.

METALS

Project Name: LEDGE RD LANDFILL
Lab Number: L2413165
Project Number: 289302
Report Date: 03/12/24

SAMPLE RESULTS

Lab ID: L2413165-01
Client ID: WE-3-SW-5
Sample Location: ANDOVER, MA
Date Collected: 03/11/24 10:50
Date Received: 03/11/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 22%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	2380		mg/kg	3.44	--	2	03/12/24 07:30	03/12/24 10:00	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2413165
Project Number: 289302
Report Date: 03/12/24

SAMPLE RESULTS

Lab ID: L2413165-02
Client ID: WE-3-SW-6
Sample Location: ANDOVER, MA
Date Collected: 03/11/24 10:55
Date Received: 03/11/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 29%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	1710		mg/kg	13.1	--	10	03/12/24 07:30	03/12/24 11:20	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2413165
Project Number: 289302
Report Date: 03/12/24

SAMPLE RESULTS

Lab ID: L2413165-03
Client ID: WE-3-SW-7
Sample Location: ANDOVER, MA
Date Collected: 03/11/24 11:00
Date Received: 03/11/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 26%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	223		mg/kg	2.90	--	2	03/12/24 07:30	03/12/24 10:09	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2413165
Project Number: 289302
Report Date: 03/12/24

SAMPLE RESULTS

Lab ID: L2413165-04
Client ID: WE-3-SW-8
Sample Location: ANDOVER, MA
Date Collected: 03/11/24 11:05
Date Received: 03/11/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 29%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	266		mg/kg	2.67	--	2	03/12/24 07:30	03/12/24 10:13	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2413165
Project Number: 289302
Report Date: 03/12/24

SAMPLE RESULTS

Lab ID: L2413165-05
Client ID: WE-3-SW-9
Sample Location: ANDOVER, MA
Date Collected: 03/11/24 11:10
Date Received: 03/11/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 21%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	632		mg/kg	3.68	--	2	03/12/24 07:30	03/12/24 10:17	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2413165
Project Number: 289302
Report Date: 03/12/24

SAMPLE RESULTS

Lab ID: L2413165-06
Client ID: WE-3-SW-10
Sample Location: ANDOVER, MA
Date Collected: 03/11/24 11:15
Date Received: 03/11/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 38%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	524		mg/kg	2.00	--	2	03/12/24 07:30	03/12/24 10:22	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2413165
Project Number: 289302
Report Date: 03/12/24

SAMPLE RESULTS

Lab ID: L2413165-07
Client ID: WE-3-SW-11
Sample Location: ANDOVER, MA
Date Collected: 03/11/24 11:20
Date Received: 03/11/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 14%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	386		mg/kg	5.51	--	2	03/12/24 07:30	03/12/24 10:26	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2413165
Project Number: 289302
Report Date: 03/12/24

SAMPLE RESULTS

Lab ID: L2413165-08
Client ID: WE-3-B-3
Sample Location: ANDOVER, MA
Date Collected: 03/11/24 12:30
Date Received: 03/11/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 28%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	203		mg/kg	2.77	--	2	03/12/24 07:30	03/12/24 10:59	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2413165
Project Number: 289302
Report Date: 03/12/24

SAMPLE RESULTS

Lab ID: L2413165-09
Client ID: WE-3-B-4
Sample Location: ANDOVER, MA
Date Collected: 03/11/24 12:35
Date Received: 03/11/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 28%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	134		mg/kg	2.83	--	2	03/12/24 07:30	03/12/24 11:03	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL **Lab Number:** L2413165

Project Number: 289302 **Report Date:** 03/12/24

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-09 Batch: WG1894964-1										
Arsenic, Total	ND		mg/kg	0.400	--	1	03/12/24 07:30	03/12/24 09:47	97,6010D	DHL

Prep Information

Digestion Method: EPA 3050B

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2413165

Report Date: 03/12/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-09 Batch: WG1894964-2 WG1894964-3 SRM Lot Number: D123-540								
Arsenic, Total	101		97		82-118	4		30

INORGANICS
&
MISCELLANEOUS

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2413165
Report Date: 03/12/24

SAMPLE RESULTS

Lab ID: L2413165-01
Client ID: WE-3-SW-5
Sample Location: ANDOVER, MA

Date Collected: 03/11/24 10:50
Date Received: 03/11/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	22.4		%	0.100	NA	1	-	03/11/24 20:44	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2413165
Report Date: 03/12/24

SAMPLE RESULTS

Lab ID: L2413165-02
Client ID: WE-3-SW-6
Sample Location: ANDOVER, MA

Date Collected: 03/11/24 10:55
Date Received: 03/11/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	28.7		%	0.100	NA	1	-	03/11/24 20:44	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2413165
Report Date: 03/12/24

SAMPLE RESULTS

Lab ID: L2413165-03
Client ID: WE-3-SW-7
Sample Location: ANDOVER, MA

Date Collected: 03/11/24 11:00
Date Received: 03/11/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	26.2		%	0.100	NA	1	-	03/11/24 20:44	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2413165
Report Date: 03/12/24

SAMPLE RESULTS

Lab ID: L2413165-04
Client ID: WE-3-SW-8
Sample Location: ANDOVER, MA

Date Collected: 03/11/24 11:05
Date Received: 03/11/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	28.5		%	0.100	NA	1	-	03/11/24 20:44	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2413165
Report Date: 03/12/24

SAMPLE RESULTS

Lab ID: L2413165-05
Client ID: WE-3-SW-9
Sample Location: ANDOVER, MA

Date Collected: 03/11/24 11:10
Date Received: 03/11/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	20.6		%	0.100	NA	1	-	03/11/24 20:44	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2413165
Report Date: 03/12/24

SAMPLE RESULTS

Lab ID: L2413165-06
Client ID: WE-3-SW-10
Sample Location: ANDOVER, MA

Date Collected: 03/11/24 11:15
Date Received: 03/11/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	37.6		%	0.100	NA	1	-	03/11/24 20:44	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2413165
Report Date: 03/12/24

SAMPLE RESULTS

Lab ID: L2413165-07
Client ID: WE-3-SW-11
Sample Location: ANDOVER, MA

Date Collected: 03/11/24 11:20
Date Received: 03/11/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	13.9		%	0.100	NA	1	-	03/11/24 20:44	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2413165
Report Date: 03/12/24

SAMPLE RESULTS

Lab ID: L2413165-08
Client ID: WE-3-B-3
Sample Location: ANDOVER, MA

Date Collected: 03/11/24 12:30
Date Received: 03/11/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	28.0		%	0.100	NA	1	-	03/11/24 20:44	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2413165
Report Date: 03/12/24

SAMPLE RESULTS

Lab ID: L2413165-09
Client ID: WE-3-B-4
Sample Location: ANDOVER, MA

Date Collected: 03/11/24 12:35
Date Received: 03/11/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	27.8		%	0.100	NA	1	-	03/11/24 20:44	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2413165
Report Date: 03/12/24

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2413165-01A	Plastic 2oz unpreserved for TS	A	NA		4.8	Y	Absent		TS(7)
L2413165-01B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.8	Y	Absent		MCP-AS-6010T-10(180)
L2413165-02A	Plastic 2oz unpreserved for TS	A	NA		4.8	Y	Absent		TS(7)
L2413165-02B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.8	Y	Absent		MCP-AS-6010T-10(180)
L2413165-03A	Plastic 2oz unpreserved for TS	A	NA		4.8	Y	Absent		TS(7)
L2413165-03B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.8	Y	Absent		MCP-AS-6010T-10(180)
L2413165-04A	Plastic 2oz unpreserved for TS	A	NA		4.8	Y	Absent		TS(7)
L2413165-04B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.8	Y	Absent		MCP-AS-6010T-10(180)
L2413165-05A	Plastic 2oz unpreserved for TS	A	NA		4.8	Y	Absent		TS(7)
L2413165-05B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.8	Y	Absent		MCP-AS-6010T-10(180)
L2413165-06A	Plastic 2oz unpreserved for TS	A	NA		4.8	Y	Absent		TS(7)
L2413165-06B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.8	Y	Absent		MCP-AS-6010T-10(180)
L2413165-07A	Plastic 2oz unpreserved for TS	A	NA		4.8	Y	Absent		TS(7)
L2413165-07B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.8	Y	Absent		MCP-AS-6010T-10(180)
L2413165-08A	Plastic 2oz unpreserved for TS	A	NA		4.8	Y	Absent		TS(7)
L2413165-08B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.8	Y	Absent		MCP-AS-6010T-10(180)
L2413165-09A	Plastic 2oz unpreserved for TS	A	NA		4.8	Y	Absent		TS(7)
L2413165-09B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.8	Y	Absent		MCP-AS-6010T-10(180)

*Values in parentheses indicate holding time in days

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2413165
Project Number:	289302	**Report Date:**	03/12/24

GLOSSARY

Acronyms

DL - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EMPC - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LOD - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

LOQ - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

NR - No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TEF - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.

TEQ - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2413165
Project Number:	289302	**Report Date:**	03/12/24

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2413165
Project Number:	289302	**Report Date:**	03/12/24

Data Qualifiers

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2413165
Project Number:	289302	**Report Date:**	03/12/24

REFERENCES

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010; WSC-CAM-IIIA and IIID, January 2024; and WSC-CAM-IIIB and VA, February 2024.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 3/11/24

ALPHA Job #: L2413165

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: CDM Smith
Address: 75 State Street, Suite 701
Boston, MA 02109
Phone: 617-452-6563
Fax:
Email: JonesNE@cdmsmith.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Ledge Rd Landfill
Project Location: Andover, MA
Project #: 289302
Project Manager: Nathan Jones
ALPHA Quote #:

Turn-Around Time

☐ Standard ☒ RUSH (only confirmed if pre-approved)
Date Due: Time: 1 day

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program: MassDEP Criteria: RCS-1 Soil Standards

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

☒ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☒ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

include petersoncr@cdmsmith on all emails

ANALYSIS: Total Arsenic

SAMPLE HANDLING
Filtration
☐ Done
☒ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	Total Arsenic	Sample Specific Comments
13165-01	WE-3-SW-5	3/11/24	10:50	SO	KG	X	
02	WE-3-SW-6		10:55	SO			
03	WE-3-SW-7		11:00				
04	WE-3-SW-8		11:05				
05	WE-3-SW-9		11:10				
06	WE-3-SW-10		11:15				
07	WE-3-SW-11		11:20				
08	WE-3-B-3		12:30				
09	WE-3-B-4		12:35				

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP or CT RCP?

Container Type	
Preservative	

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	3/11/24 K:15	Rob Mauro AA	3-11-24 1700
[signature]	3/11/24 1810	[signature]	3/11/24 1810

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 16-Jan-2018)

ANALYTICAL REPORT

Lab Number:	L2413393
Client:	CDM Smith, Inc. 75 State Street Suite 701 Boston, MA 02109
ATTN:	Nathan Jones
Phone:	(617) 452-6563
Project Name:	LEDGE RD LANDFILL
Project Number:	289302
Report Date:	03/13/24

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2413393
Report Date: 03/13/24

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2413393-01	WE-7-SW-1	SOIL	ANDOVER, MA	03/12/24 10:30	03/12/24
L2413393-02	WE-7-SW-2	SOIL	ANDOVER, MA	03/12/24 10:35	03/12/24
L2413393-03	WE-7-SW-3	SOIL	ANDOVER, MA	03/12/24 10:40	03/12/24
L2413393-04	WE-7-SW-4	SOIL	ANDOVER, MA	03/12/24 10:45	03/12/24
L2413393-05	WE-7-SW-5	SOIL	ANDOVER, MA	03/12/24 10:50	03/12/24
L2413393-06	WE-7-SW-6	SOIL	ANDOVER, MA	03/12/24 10:55	03/12/24
L2413393-07	WE-7-SW-7	SOIL	ANDOVER, MA	03/12/24 11:00	03/12/24
L2413393-08	DUPE-4	SOIL	ANDOVER, MA	03/12/24 00:00	03/12/24
L2413393-09	WE-7-B-1	SOIL	ANDOVER, MA	03/12/24 12:15	03/12/24
L2413393-10	WE-7-B-2	SOIL	ANDOVER, MA	03/12/24 12:20	03/12/24
L2413393-11	WE-7-B-3	SOIL	ANDOVER, MA	03/12/24 12:25	03/12/24

Project Name: LEDGE RD LANDFILL **Lab Number:** L2413393

Project Number: 289302 **Report Date:** 03/13/24

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	NO

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2413393
Project Number:	289302	**Report Date:**	03/13/24

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2413393
Project Number:	289302	**Report Date:**	03/13/24

Case Narrative (continued)

MCP Related Narratives

Sample Receipt

In reference to question H:

A Matrix Spike was not submitted for the analysis of Total Metals.

Total Metals

L2413393-01 through -11: The sample has an elevated detection limit due to the dilution required by the sample matrix.

In reference to question I:

All samples were analyzed for a subset of MCP analytes per client request.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Michelle M. Morris

Title: Technical Director/Representative Date: 03/13/24

QC OUTLIER SUMMARY REPORT

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2413393
Report Date: 03/13/24

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment

There are no QC Outliers associated with this report.

METALS

Project Name: LEDGE RD LANDFILL
Lab Number: L2413393
Project Number: 289302
Report Date: 03/13/24

SAMPLE RESULTS

Lab ID: L2413393-01
Client ID: WE-7-SW-1
Sample Location: ANDOVER, MA
Date Collected: 03/12/24 10:30
Date Received: 03/12/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 75%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	17.4		mg/kg	2.60	--	5	03/13/24 09:10	03/13/24 15:11	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2413393
Project Number: 289302
Report Date: 03/13/24

SAMPLE RESULTS

Lab ID: L2413393-02
Client ID: WE-7-SW-2
Sample Location: ANDOVER, MA
Date Collected: 03/12/24 10:35
Date Received: 03/12/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 47%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	56.4		mg/kg	4.01	--	5	03/13/24 09:10	03/13/24 15:17	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2413393
Project Number: 289302
Report Date: 03/13/24

SAMPLE RESULTS

Lab ID: L2413393-03
Client ID: WE-7-SW-3
Sample Location: ANDOVER, MA
Date Collected: 03/12/24 10:40
Date Received: 03/12/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 34%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	81.7		mg/kg	5.61	--	5	03/13/24 09:10	03/13/24 15:24	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2413393
Project Number: 289302
Report Date: 03/13/24

SAMPLE RESULTS

Lab ID: L2413393-04
Client ID: WE-7-SW-4
Sample Location: ANDOVER, MA
Date Collected: 03/12/24 10:45
Date Received: 03/12/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 63%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	6.46		mg/kg	3.06	--	5	03/13/24 09:10	03/13/24 15:30	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2413393
Project Number: 289302
Report Date: 03/13/24

SAMPLE RESULTS

Lab ID: L2413393-05
Client ID: WE-7-SW-5
Sample Location: ANDOVER, MA
Date Collected: 03/12/24 10:50
Date Received: 03/12/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 42%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	11.8		mg/kg	4.68	--	5	03/13/24 09:10	03/13/24 15:36	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2413393
Project Number: 289302
Report Date: 03/13/24

SAMPLE RESULTS

Lab ID: L2413393-06
Client ID: WE-7-SW-6
Sample Location: ANDOVER, MA
Date Collected: 03/12/24 10:55
Date Received: 03/12/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 45%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	117		mg/kg	4.36	--	5	03/13/24 09:10	03/13/24 15:43	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2413393
Project Number: 289302
Report Date: 03/13/24

SAMPLE RESULTS

Lab ID: L2413393-07
Client ID: WE-7-SW-7
Sample Location: ANDOVER, MA
Date Collected: 03/12/24 11:00
Date Received: 03/12/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 27%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	268		mg/kg	7.20	--	5	03/13/24 09:10	03/13/24 15:49	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2413393
Project Number: 289302
Report Date: 03/13/24

SAMPLE RESULTS

Lab ID: L2413393-08
Client ID: DUPE-4
Sample Location: ANDOVER, MA
Date Collected: 03/12/24 00:00
Date Received: 03/12/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 70%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	15.6		mg/kg	2.79	--	5	03/13/24 09:10	03/13/24 16:41	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2413393
Project Number: 289302
Report Date: 03/13/24

SAMPLE RESULTS

Lab ID: L2413393-09
Client ID: WE-7-B-1
Sample Location: ANDOVER, MA
Date Collected: 03/12/24 12:15
Date Received: 03/12/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 37%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	150		mg/kg	5.24	--	5	03/13/24 09:10	03/13/24 16:48	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2413393
Project Number: 289302
Report Date: 03/13/24

SAMPLE RESULTS

Lab ID: L2413393-10
Client ID: WE-7-B-2
Sample Location: ANDOVER, MA
Date Collected: 03/12/24 12:20
Date Received: 03/12/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 39%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	350		mg/kg	4.93	--	5	03/13/24 09:10	03/13/24 16:54	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2413393
Project Number: 289302
Report Date: 03/13/24

SAMPLE RESULTS

Lab ID: L2413393-11
Client ID: WE-7-B-3
Sample Location: ANDOVER, MA
Date Collected: 03/12/24 12:25
Date Received: 03/12/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 42%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	379		mg/kg	4.60	--	5	03/13/24 09:10	03/13/24 17:01	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL **Lab Number:** L2413393

Project Number: 289302 **Report Date:** 03/13/24

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-11 Batch: WG1895499-1										
Arsenic, Total	ND		mg/kg	0.400	--	1	03/13/24 09:10	03/13/24 14:52	97,6010D	DHL

Prep Information

Digestion Method: EPA 3050B

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2413393

Report Date: 03/13/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-11 Batch: WG1895499-2 WG1895499-3 SRM Lot Number: D123-540								
Arsenic, Total	88		105		82-118	18		30

INORGANICS
&
MISCELLANEOUS

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2413393
Report Date: 03/13/24

SAMPLE RESULTS

Lab ID: L2413393-01
Client ID: WE-7-SW-1
Sample Location: ANDOVER, MA

Date Collected: 03/12/24 10:30
Date Received: 03/12/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	74.5		%	0.100	NA	1	-	03/12/24 21:32	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2413393
Report Date: 03/13/24

SAMPLE RESULTS

Lab ID: L2413393-02
Client ID: WE-7-SW-2
Sample Location: ANDOVER, MA

Date Collected: 03/12/24 10:35
Date Received: 03/12/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	47.4		%	0.100	NA	1	-	03/12/24 21:32	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2413393
Report Date: 03/13/24

SAMPLE RESULTS

Lab ID: L2413393-03
Client ID: WE-7-SW-3
Sample Location: ANDOVER, MA

Date Collected: 03/12/24 10:40
Date Received: 03/12/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	33.9		%	0.100	NA	1	-	03/12/24 21:32	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2413393
Report Date: 03/13/24

SAMPLE RESULTS

Lab ID: L2413393-04
Client ID: WE-7-SW-4
Sample Location: ANDOVER, MA

Date Collected: 03/12/24 10:45
Date Received: 03/12/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	62.7		%	0.100	NA	1	-	03/12/24 21:32	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2413393
Report Date: 03/13/24

SAMPLE RESULTS

Lab ID: L2413393-05
Client ID: WE-7-SW-5
Sample Location: ANDOVER, MA

Date Collected: 03/12/24 10:50
Date Received: 03/12/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	41.5		%	0.100	NA	1	-	03/12/24 21:32	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2413393
Report Date: 03/13/24

SAMPLE RESULTS

Lab ID: L2413393-06
Client ID: WE-7-SW-6
Sample Location: ANDOVER, MA

Date Collected: 03/12/24 10:55
Date Received: 03/12/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	44.9		%	0.100	NA	1	-	03/12/24 21:32	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2413393
Report Date: 03/13/24

SAMPLE RESULTS

Lab ID: L2413393-07
Client ID: WE-7-SW-7
Sample Location: ANDOVER, MA

Date Collected: 03/12/24 11:00
Date Received: 03/12/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	27.1		%	0.100	NA	1	-	03/12/24 21:32	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2413393
Report Date: 03/13/24

SAMPLE RESULTS

Lab ID: L2413393-08
Client ID: DUPE-4
Sample Location: ANDOVER, MA

Date Collected: 03/12/24 00:00
Date Received: 03/12/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	69.6		%	0.100	NA	1	-	03/12/24 21:32	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2413393
Report Date: 03/13/24

SAMPLE RESULTS

Lab ID: L2413393-09
Client ID: WE-7-B-1
Sample Location: ANDOVER, MA

Date Collected: 03/12/24 12:15
Date Received: 03/12/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	37.2		%	0.100	NA	1	-	03/12/24 21:32	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2413393
Report Date: 03/13/24

SAMPLE RESULTS

Lab ID: L2413393-10
Client ID: WE-7-B-2
Sample Location: ANDOVER, MA

Date Collected: 03/12/24 12:20
Date Received: 03/12/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	39.0		%	0.100	NA	1	-	03/12/24 21:32	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2413393
Report Date: 03/13/24

SAMPLE RESULTS

Lab ID: L2413393-11
Client ID: WE-7-B-3
Sample Location: ANDOVER, MA

Date Collected: 03/12/24 12:25
Date Received: 03/12/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	42.1		%	0.100	NA	1	-	03/12/24 21:32	121,2540G	WJM

Lab Duplicate Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2413393

Report Date: 03/13/24

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-11 QC Batch ID: WG1895388-1 QC Sample: L2413393-01 Client ID: WE-7-SW-1						
Solids, Total	74.5	76.2	%	2		20

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2413393
Report Date: 03/13/24

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2413393-01A	Plastic 2oz unpreserved for TS	A	NA		3.6	Y	Absent		MCP-AS-6010T-10(180)
L2413393-01B	Glass 60mL/2oz unpreserved	A	NA		3.6	Y	Absent		TS(7)
L2413393-02A	Plastic 2oz unpreserved for TS	A	NA		3.6	Y	Absent		MCP-AS-6010T-10(180)
L2413393-02B	Glass 60mL/2oz unpreserved	A	NA		3.6	Y	Absent		TS(7)
L2413393-03A	Plastic 2oz unpreserved for TS	A	NA		3.6	Y	Absent		MCP-AS-6010T-10(180)
L2413393-03B	Glass 60mL/2oz unpreserved	A	NA		3.6	Y	Absent		TS(7)
L2413393-04A	Plastic 2oz unpreserved for TS	A	NA		3.6	Y	Absent		MCP-AS-6010T-10(180)
L2413393-04B	Glass 60mL/2oz unpreserved	A	NA		3.6	Y	Absent		TS(7)
L2413393-05A	Plastic 2oz unpreserved for TS	A	NA		3.6	Y	Absent		MCP-AS-6010T-10(180)
L2413393-05B	Glass 60mL/2oz unpreserved	A	NA		3.6	Y	Absent		TS(7)
L2413393-06A	Plastic 2oz unpreserved for TS	A	NA		3.6	Y	Absent		MCP-AS-6010T-10(180)
L2413393-06B	Glass 60mL/2oz unpreserved	A	NA		3.6	Y	Absent		TS(7)
L2413393-07A	Plastic 2oz unpreserved for TS	A	NA		3.6	Y	Absent		MCP-AS-6010T-10(180)
L2413393-07B	Glass 60mL/2oz unpreserved	A	NA		3.6	Y	Absent		TS(7)
L2413393-08A	Plastic 2oz unpreserved for TS	A	NA		3.6	Y	Absent		MCP-AS-6010T-10(180)
L2413393-08B	Glass 60mL/2oz unpreserved	A	NA		3.6	Y	Absent		TS(7)
L2413393-09A	Plastic 2oz unpreserved for TS	A	NA		3.6	Y	Absent		MCP-AS-6010T-10(180)
L2413393-09B	Glass 60mL/2oz unpreserved	A	NA		3.6	Y	Absent		TS(7)
L2413393-10A	Plastic 2oz unpreserved for TS	A	NA		3.6	Y	Absent		MCP-AS-6010T-10(180)
L2413393-10B	Glass 60mL/2oz unpreserved	A	NA		3.6	Y	Absent		TS(7)
L2413393-11A	Plastic 2oz unpreserved for TS	A	NA		3.6	Y	Absent		MCP-AS-6010T-10(180)
L2413393-11B	Glass 60mL/2oz unpreserved	A	NA		3.6	Y	Absent		TS(7)

*Values in parentheses indicate holding time in days

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2413393
Project Number:	289302	**Report Date:**	03/13/24

GLOSSARY

Acronyms

DL - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EMPC - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LOD - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

LOQ - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

NR - No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TEF - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.

TEQ - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2413393
Project Number:	289302	**Report Date:**	03/13/24

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2413393
Project Number:	289302	**Report Date:**	03/13/24

Data Qualifiers

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: Data Usability Report

REFERENCES

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010; WSC-CAM-IIIA and IIID, January 2024; and WSC-CAM-IIIB and VA, February 2024.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

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ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 3/12/24

ALPHA Job #: L2413393

Client Information

Client: CDM Smith
Address: 75 State Street, Suite 701
Boston, MA 02109
Phone: 617-452-6563
Fax:
Email: JonesNE@cdmsmith.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Ledge Rd Landfill
Project Location: Andover, MA
Project #: 289302
Project Manager: Nathan Jones
ALPHA Quote #:

Turn-Around Time

☐ Standard ☒ RUSH (prior approval required)
Date Due: Time: 1 day

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program: MassDEP Criteria: RCS-1 Soil Standards

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

☒ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☒ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

include petersoncr@cdmsmith on all emails

ANALYSIS — Total Arsenic

SAMPLE HANDLING
Filtration
☐ Done
☒ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	Total Arsenic	Sample Specific Comments
13393-01	WE-7-SW-1	3/12/24	10:30	SO	KG	X	
02	WE-7-SW-2	3/12/24	10:35	SO			
03	WE-7-SW-3	3/12/24	10:40				
04	WE-7-SW-4	3/12/24	10:45				
05	WE-7-SW-5	3/12/24	10:50				
06	WE-7-SW-6	3/12/24	10:55				
07	WE-7-SW-7	3/12/24	11:00				
08	Dupe-4	3/12/24	—				
09	WE-7-B-1	3/12/24	12:15				
10	WE-7-B-2	3/12/24	12:20				

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP or CT RCP?

	Container Type									
	Preservative									

Relinquished By:	Date/Time	Received By:	Date/Time
	3/12/24 15:45		3/12/24 15:45
	3/12/24 1930		3/12/24 1930

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 16-Jan-2015)

CHAIN OF CUSTODY

PAGE 2 OF 2

Date Rec'd in Lab: 3/12/24

ALPHA Job #: L2413393

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: CDM Smith
Address: 75 State Street, Suite 701
Boston, MA 02109
Phone: 617-452-6563
Fax:
Email: JonesNE@cdmsmith.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Ledge Rd Landfill
Project Location: Andover, MA
Project #: 289302
Project Manager: Nathan Jones
ALPHA Quote #:

Turn-Around Time

☐ Standard ☒ RUSH (only confirmed if pre-approved)
Date Due: Time: 1 day

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program: MassDEP Criteria: RCS-1 Soil Standards

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

☒ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☒ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

include petersoncr@cdmsmith on all emails

ANALYSIS: Total Arsenic

SAMPLE HANDLING
Filtration
☐ Done
☒ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	Total Arsenic	Sample Specific Comments
13393-1C	WE-7-B-3	3/12/24	12:25	SO	KG	X	
				SO			

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP or CT RCP?

	Container Type																	
	Preservative																	

Relinquished By:	Date/Time	Received By:	Date/Time
	3/12/24/15:45		3/12/24 1545
	3/12/24 1920		3/12/24 1920

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 18-Jan-2013)

ANALYTICAL REPORT

Lab Number:	L2414089
Client:	CDM Smith, Inc. 75 State Street Suite 701 Boston, MA 02109
ATTN:	Nathan Jones
Phone:	(617) 452-6563
Project Name:	LEDGE RD LANDFILL
Project Number:	289302
Report Date:	03/15/24

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414089
Report Date: 03/15/24

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2414089-01	WE-5-SW-1	SOIL	ANDOVER, MA	03/12/24 13:05	03/14/24
L2414089-02	WE-5-SW-2	SOIL	ANDOVER, MA	03/12/24 13:10	03/14/24
L2414089-03	WE-5-SW-3	SOIL	ANDOVER, MA	03/12/24 13:15	03/14/24
L2414089-04	WE-5-SW-4	SOIL	ANDOVER, MA	03/12/24 13:20	03/14/24
L2414089-05	WE-5-SW-5	SOIL	ANDOVER, MA	03/12/24 13:25	03/14/24
L2414089-06	WE-5-SW-6	SOIL	ANDOVER, MA	03/12/24 13:30	03/14/24
L2414089-07	WE-5-SW-7	SOIL	ANDOVER, MA	03/12/24 13:35	03/14/24
L2414089-08	WE-5-SW-8	SOIL	ANDOVER, MA	03/12/24 13:40	03/14/24
L2414089-09	DUPE 5	SOIL	ANDOVER, MA	03/12/24 00:00	03/14/24
L2414089-10	WE-5-B-1	SOIL	ANDOVER, MA	03/12/24 14:45	03/14/24
L2414089-11	WE-5-B-2	SOIL	ANDOVER, MA	03/12/24 14:50	03/14/24
L2414089-12	WE-5-B-3	SOIL	ANDOVER, MA	03/12/24 14:55	03/14/24
L2414089-13	WE-5-B-4	SOIL	ANDOVER, MA	03/12/24 15:00	03/14/24
L2414089-14	WE-5-B-5	SOIL	ANDOVER, MA	03/12/24 15:05	03/14/24
L2414089-15	DUPE 6	SOIL	ANDOVER, MA	03/12/24 00:00	03/14/24

Project Name: LEDGE RD LANDFILL **Lab Number:** L2414089

Project Number: 289302 **Report Date:** 03/15/24

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	NO

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2414089
Project Number:	289302	**Report Date:**	03/15/24

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: LEDGE RD LANDFILL **Lab Number:** L2414089
Project Number: 289302 **Report Date:** 03/15/24

Case Narrative (continued)

MCP Related Narratives

Total Metals

L2414089-01 through -15: The sample has an elevated detection limit for arsenic, due to the dilution required by the sample matrix.

In reference to question H:

The WG1896563-4/-5 MS/MSD recoveries, performed on L2414089-02, are outside the acceptance criteria for arsenic (0%). Re-analysis of the MS/MSD yielded unacceptable recoveries of <30%, but the sample detection is above the RL. The LCS recovery is acceptable; therefore, no further action was taken.

In reference to question I:

All samples were analyzed for a subset of MCP analytes per client request.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Kelly O'Neill

Title: Technical Director/Representative Date: 03/15/24

QC OUTLIER SUMMARY REPORT

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414089
Report Date: 03/15/24

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment
MCP Total Metals - Mansfield Lab								
6010D	Batch QC (L2414089-02)	WG1896563-4	Arsenic, Total	MS	0	75-125	01-15	potential low bias
6010D	Batch QC (L2414089-02)	WG1896563-5	Arsenic, Total	MSD	0	75-125	01-15	potential low bias

METALS

Project Name: LEDGE RD LANDFILL
Lab Number: L2414089
Project Number: 289302
Report Date: 03/15/24

SAMPLE RESULTS

Lab ID: L2414089-01
Client ID: WE-5-SW-1
Sample Location: ANDOVER, MA
Date Collected: 03/12/24 13:05
Date Received: 03/14/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 19%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	487		mg/kg	4.12	--	2	03/15/24 09:10	03/15/24 14:13	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL
Lab Number: L2414089
Project Number: 289302
Report Date: 03/15/24

SAMPLE RESULTS

Lab ID: L2414089-02
Client ID: WE-5-SW-2
Sample Location: ANDOVER, MA
Date Collected: 03/12/24 13:10
Date Received: 03/14/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 16%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	708		mg/kg	4.92	--	2	03/15/24 09:10	03/15/24 14:35	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL
Lab Number: L2414089
Project Number: 289302
Report Date: 03/15/24

SAMPLE RESULTS

Lab ID: L2414089-03
Client ID: WE-5-SW-3
Sample Location: ANDOVER, MA
Date Collected: 03/12/24 13:15
Date Received: 03/14/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 14%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	2500		mg/kg	5.52	--	2	03/15/24 09:10	03/15/24 14:21	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL
Lab Number: L2414089
Project Number: 289302
Report Date: 03/15/24

SAMPLE RESULTS

Lab ID: L2414089-04
Client ID: WE-5-SW-4
Sample Location: ANDOVER, MA
Date Collected: 03/12/24 13:20
Date Received: 03/14/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 20%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	97.9		mg/kg	3.88	--	2	03/15/24 09:10	03/15/24 14:28	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL
Lab Number: L2414089
Project Number: 289302
Report Date: 03/15/24

SAMPLE RESULTS

Lab ID: L2414089-05
Client ID: WE-5-SW-5
Sample Location: ANDOVER, MA
Date Collected: 03/12/24 13:25
Date Received: 03/14/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 17%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	2270		mg/kg	4.64	--	2	03/15/24 09:10	03/15/24 15:56	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL
Lab Number: L2414089
Project Number: 289302
Report Date: 03/15/24

SAMPLE RESULTS

Lab ID: L2414089-06
Client ID: WE-5-SW-6
Sample Location: ANDOVER, MA
Date Collected: 03/12/24 13:30
Date Received: 03/14/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 16%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	1290		mg/kg	24.1	--	10	03/15/24 09:10	03/15/24 17:34	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL
Lab Number: L2414089
Project Number: 289302
Report Date: 03/15/24

SAMPLE RESULTS

Lab ID: L2414089-07
Client ID: WE-5-SW-7
Sample Location: ANDOVER, MA
Date Collected: 03/12/24 13:35
Date Received: 03/14/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 26%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	44.7		mg/kg	3.04	--	2	03/15/24 09:10	03/15/24 16:11	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL
Lab Number: L2414089
Project Number: 289302
Report Date: 03/15/24

SAMPLE RESULTS

Lab ID: L2414089-08
Client ID: WE-5-SW-8
Sample Location: ANDOVER, MA
Date Collected: 03/12/24 13:40
Date Received: 03/14/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 24%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	372		mg/kg	16.1	--	10	03/15/24 09:10	03/15/24 17:41	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL
Lab Number: L2414089
Project Number: 289302
Report Date: 03/15/24

SAMPLE RESULTS

Lab ID: L2414089-09
Client ID: DUPE 5
Sample Location: ANDOVER, MA
Date Collected: 03/12/24 00:00
Date Received: 03/14/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 20%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	364		mg/kg	3.92	--	2	03/15/24 09:10	03/15/24 16:27	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL
Lab Number: L2414089
Project Number: 289302
Report Date: 03/15/24

SAMPLE RESULTS

Lab ID: L2414089-10
Client ID: WE-5-B-1
Sample Location: ANDOVER, MA
Date Collected: 03/12/24 14:45
Date Received: 03/14/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 39%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	99.6		mg/kg	2.01	--	2	03/15/24 09:10	03/15/24 16:34	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL
Lab Number: L2414089
Project Number: 289302
Report Date: 03/15/24

SAMPLE RESULTS

Lab ID: L2414089-11
Client ID: WE-5-B-2
Sample Location: ANDOVER, MA
Date Collected: 03/12/24 14:50
Date Received: 03/14/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 17%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	596		mg/kg	4.48	--	2	03/15/24 09:10	03/15/24 16:41	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL
Lab Number: L2414089
Project Number: 289302
Report Date: 03/15/24

SAMPLE RESULTS

Lab ID: L2414089-12
Client ID: WE-5-B-3
Sample Location: ANDOVER, MA
Date Collected: 03/12/24 14:55
Date Received: 03/14/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 22%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	1840		mg/kg	8.79	--	5	03/15/24 09:10	03/15/24 17:49	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL
Lab Number: L2414089
Project Number: 289302
Report Date: 03/15/24

SAMPLE RESULTS

Lab ID: L2414089-13
Client ID: WE-5-B-4
Sample Location: ANDOVER, MA
Date Collected: 03/12/24 15:00
Date Received: 03/14/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 27%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	220		mg/kg	2.91	--	2	03/15/24 09:10	03/15/24 17:11	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL
Lab Number: L2414089
Project Number: 289302
Report Date: 03/15/24

SAMPLE RESULTS

Lab ID: L2414089-14
Client ID: WE-5-B-5
Sample Location: ANDOVER, MA
Date Collected: 03/12/24 15:05
Date Received: 03/14/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 30%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	229		mg/kg	2.65	--	2	03/15/24 09:10	03/15/24 17:19	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL
Lab Number: L2414089
Project Number: 289302
Report Date: 03/15/24

SAMPLE RESULTS

Lab ID: L2414089-15
Client ID: DUPE 6
Sample Location: ANDOVER, MA
Date Collected: 03/12/24 00:00
Date Received: 03/14/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 23%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	820		mg/kg	6.76	--	4	03/15/24 09:10	03/15/24 17:57	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2414089
Report Date: 03/15/24

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-15 Batch: WG1896563-1										
Arsenic, Total	ND		mg/kg	0.400	--	1	03/15/24 09:10	03/15/24 15:34	97,6010D	DMC

Prep Information

Digestion Method: EPA 3050B

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2414089

Report Date: 03/15/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-15 Batch: WG1896563-2 WG1896563-3 SRM Lot Number: D123-540								
Arsenic, Total	92		87		82-118	6		30

Matrix Spike Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414089
Report Date: 03/15/24

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-15 QC Batch ID: WG1896563-4 WG1896563-5 QC Sample: L2414089-02 Client ID: WE-5-SW-2												
Arsenic, Total	708	57.6	427	**0**	Q	445	**0**	Q	75-125	4		35

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Serial Dilution Analysis
Batch Quality Control

Lab Number: L2414089
Report Date: 03/15/24

Parameter	Native Sample	Serial Dilution	Units	% D	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-15 QC Batch ID: WG1896563-6 QC Sample: L2414089-02 Client ID: WE-5-SW-2						
Arsenic, Total	708	830	mg/kg	17		20

INORGANICS
&
MISCELLANEOUS

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414089
Report Date: 03/15/24

SAMPLE RESULTS

Lab ID: L2414089-01
Client ID: WE-5-SW-1
Sample Location: ANDOVER, MA

Date Collected: 03/12/24 13:05
Date Received: 03/14/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	18.6		%	0.100	NA	1	-	03/14/24 22:45	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414089
Report Date: 03/15/24

SAMPLE RESULTS

Lab ID: L2414089-02
Client ID: WE-5-SW-2
Sample Location: ANDOVER, MA

Date Collected: 03/12/24 13:10
Date Received: 03/14/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	15.9		%	0.100	NA	1	-	03/14/24 22:45	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414089
Report Date: 03/15/24

SAMPLE RESULTS

Lab ID: L2414089-03
Client ID: WE-5-SW-3
Sample Location: ANDOVER, MA

Date Collected: 03/12/24 13:15
Date Received: 03/14/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	13.9		%	0.100	NA	1	-	03/14/24 22:45	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414089
Report Date: 03/15/24

SAMPLE RESULTS

Lab ID: L2414089-04
Client ID: WE-5-SW-4
Sample Location: ANDOVER, MA

Date Collected: 03/12/24 13:20
Date Received: 03/14/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	19.8		%	0.100	NA	1	-	03/14/24 22:45	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414089
Report Date: 03/15/24

SAMPLE RESULTS

Lab ID: L2414089-05
Client ID: WE-5-SW-5
Sample Location: ANDOVER, MA

Date Collected: 03/12/24 13:25
Date Received: 03/14/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	16.8		%	0.100	NA	1	-	03/14/24 22:45	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414089
Report Date: 03/15/24

SAMPLE RESULTS

Lab ID: L2414089-06
Client ID: WE-5-SW-6
Sample Location: ANDOVER, MA

Date Collected: 03/12/24 13:30
Date Received: 03/14/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	15.7		%	0.100	NA	1	-	03/14/24 22:45	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414089
Report Date: 03/15/24

SAMPLE RESULTS

Lab ID: L2414089-07
Client ID: WE-5-SW-7
Sample Location: ANDOVER, MA

Date Collected: 03/12/24 13:35
Date Received: 03/14/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	25.8		%	0.100	NA	1	-	03/14/24 22:45	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414089
Report Date: 03/15/24

SAMPLE RESULTS

Lab ID: L2414089-08
Client ID: WE-5-SW-8
Sample Location: ANDOVER, MA

Date Collected: 03/12/24 13:40
Date Received: 03/14/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	23.6		%	0.100	NA	1	-	03/14/24 22:45	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414089
Report Date: 03/15/24

SAMPLE RESULTS

Lab ID: L2414089-09
Client ID: DUPE 5
Sample Location: ANDOVER, MA

Date Collected: 03/12/24 00:00
Date Received: 03/14/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	20.0		%	0.100	NA	1	-	03/14/24 22:45	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414089
Report Date: 03/15/24

SAMPLE RESULTS

Lab ID: L2414089-10
Client ID: WE-5-B-1
Sample Location: ANDOVER, MA

Date Collected: 03/12/24 14:45
Date Received: 03/14/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	38.9		%	0.100	NA	1	-	03/14/24 22:45	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414089
Report Date: 03/15/24

SAMPLE RESULTS

Lab ID: L2414089-11
Client ID: WE-5-B-2
Sample Location: ANDOVER, MA

Date Collected: 03/12/24 14:50
Date Received: 03/14/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	16.8		%	0.100	NA	1	-	03/14/24 22:45	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414089
Report Date: 03/15/24

SAMPLE RESULTS

Lab ID: L2414089-12
Client ID: WE-5-B-3
Sample Location: ANDOVER, MA

Date Collected: 03/12/24 14:55
Date Received: 03/14/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	21.7		%	0.100	NA	1	-	03/14/24 22:45	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414089
Report Date: 03/15/24

SAMPLE RESULTS

Lab ID: L2414089-13
Client ID: WE-5-B-4
Sample Location: ANDOVER, MA

Date Collected: 03/12/24 15:00
Date Received: 03/14/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	27.0		%	0.100	NA	1	-	03/14/24 22:45	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414089
Report Date: 03/15/24

SAMPLE RESULTS

Lab ID: L2414089-14
Client ID: WE-5-B-5
Sample Location: ANDOVER, MA

Date Collected: 03/12/24 15:05
Date Received: 03/14/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	29.5		%	0.100	NA	1	-	03/14/24 22:45	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414089
Report Date: 03/15/24

SAMPLE RESULTS

Lab ID: L2414089-15
Client ID: DUPE 6
Sample Location: ANDOVER, MA

Date Collected: 03/12/24 00:00
Date Received: 03/14/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	22.8		%	0.100	NA	1	-	03/14/24 22:45	121,2540G	WJM

Lab Duplicate Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2414089

Report Date: 03/15/24

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-15 QC Batch ID: WG1896498-1 QC Sample: L2414089-02 Client ID: WE-5-SW-2						
Solids, Total	15.9	17.4	%	9		20

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414089
Report Date: 03/15/24

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2414089-01A	Plastic 2oz unpreserved for TS	A	NA		3.1	Y	Absent		TS(7)
L2414089-01B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		3.1	Y	Absent		MCP-AS-6010T-10(180)
L2414089-02A	Plastic 2oz unpreserved for TS	A	NA		3.1	Y	Absent		TS(7)
L2414089-02A1	Plastic 2oz unpreserved for TS	A	NA		3.1	Y	Absent		TS(7)
L2414089-02A2	Plastic 2oz unpreserved for TS	A	NA		3.1	Y	Absent		TS(7)
L2414089-02B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		3.1	Y	Absent		MCP-AS-6010T-10(180)
L2414089-02B1	Metals Only-Glass 60mL/2oz unpreserved	A	NA		3.1	Y	Absent		MCP-AS-6010T-10(180)
L2414089-02B2	Metals Only-Glass 60mL/2oz unpreserved	A	NA		3.1	Y	Absent		MCP-AS-6010T-10(180)
L2414089-03A	Plastic 2oz unpreserved for TS	A	NA		3.1	Y	Absent		TS(7)
L2414089-03B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		3.1	Y	Absent		MCP-AS-6010T-10(180)
L2414089-04A	Plastic 2oz unpreserved for TS	A	NA		3.1	Y	Absent		TS(7)
L2414089-04B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		3.1	Y	Absent		MCP-AS-6010T-10(180)
L2414089-05A	Plastic 2oz unpreserved for TS	A	NA		3.1	Y	Absent		TS(7)
L2414089-05B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		3.1	Y	Absent		MCP-AS-6010T-10(180)
L2414089-06A	Plastic 2oz unpreserved for TS	A	NA		3.1	Y	Absent		TS(7)
L2414089-06B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		3.1	Y	Absent		MCP-AS-6010T-10(180)
L2414089-07A	Plastic 2oz unpreserved for TS	A	NA		3.1	Y	Absent		TS(7)
L2414089-07B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		3.1	Y	Absent		MCP-AS-6010T-10(180)
L2414089-08A	Plastic 2oz unpreserved for TS	A	NA		3.1	Y	Absent		TS(7)
L2414089-08B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		3.1	Y	Absent		MCP-AS-6010T-10(180)
L2414089-09A	Plastic 2oz unpreserved for TS	A	NA		3.1	Y	Absent		TS(7)
L2414089-09B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		3.1	Y	Absent		MCP-AS-6010T-10(180)
L2414089-10A	Plastic 2oz unpreserved for TS	A	NA		3.1	Y	Absent		TS(7)

*Values in parentheses indicate holding time in days

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414089
Report Date: 03/15/24

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2414089-10B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		3.1	Y	Absent		MCP-AS-6010T-10(180)
L2414089-11A	Plastic 2oz unpreserved for TS	A	NA		3.1	Y	Absent		TS(7)
L2414089-11B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		3.1	Y	Absent		MCP-AS-6010T-10(180)
L2414089-12A	Plastic 2oz unpreserved for TS	A	NA		3.1	Y	Absent		TS(7)
L2414089-12B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		3.1	Y	Absent		MCP-AS-6010T-10(180)
L2414089-13A	Plastic 2oz unpreserved for TS	A	NA		3.1	Y	Absent		TS(7)
L2414089-13B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		3.1	Y	Absent		MCP-AS-6010T-10(180)
L2414089-14A	Plastic 2oz unpreserved for TS	A	NA		3.1	Y	Absent		TS(7)
L2414089-14B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		3.1	Y	Absent		MCP-AS-6010T-10(180)
L2414089-15A	Plastic 2oz unpreserved for TS	A	NA		3.1	Y	Absent		TS(7)
L2414089-15B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		3.1	Y	Absent		MCP-AS-6010T-10(180)

*Values in parentheses indicate holding time in days

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2414089
Project Number:	289302	**Report Date:**	03/15/24

GLOSSARY

Acronyms

DL - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EMPC - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LOD - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

LOQ - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

NR - No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TEF - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.

TEQ - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2414089
Project Number:	289302	**Report Date:**	03/15/24

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2414089
Project Number:	289302	**Report Date:**	03/15/24

Data Qualifiers

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: Data Usability Report

REFERENCES

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010; WSC-CAM-IIIA and IIID, January 2024; and WSC-CAM-IIIB and VA, February 2024.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 2

Date Rec'd in Lab: 3/14/24

ALPHA Job #: L2414089

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: CDM Smith
Address: 75 State Street, Suite 701
Boston, MA 02109
Phone: 617-452-6563
Fax:
Email: JonesNE@cdmsmith.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Ledge Rd Landfill
Project Location: Andover, MA
Project #: 289302
Project Manager: Nathan Jones
ALPHA Quote #:

Turn-Around Time

☐ Standard ☒ RUSH (only confirmed if pre-approved)
Date Due: Time: 1 day

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client Info PO #:

Regulatory Requirements/Report Limits

State /Fed Program: MassDEP Criteria: RCS-1 Soil Standards

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

☒ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☒ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

include petersoncr@cdmsmith on all emails

ANALYSIS: Total Arsenic

SAMPLE HANDLING
Filtration
☐ Done
☒ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	Total Arsenic	Sample Specific Comments
14089-01	WE-5-SW-1	3/12/24	1305	SO	KC	X	
02	WE-5-SW-2		1310	SO			
03	WE-5-SW-3		1315				
04	WE-5-SW-4		1320				
05	WE-5-SW-5		1325				
06	WE-5-SW-6		1330				
07	WE-5-SW-7		1335				
08	WE-5-SW-8		1340				
09	Dupe 5		—				
02	WE-5-SW-2-MS		1310				

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP or CT RCP?

Container Type	
Preservative	

Relinquished By:	Date/Time	Received By:	Date/Time
Kevin Blake	3/14/24 1600		3/14/24 1630
	3/14/24 2200		3/14 2005

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 18-Jan-2010)

CHAIN OF CUSTODY

PAGE 2 OF 2

Date Rec'd in Lab: 3/14/24

ALPHA Job #: L2414089

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: CDM Smith
Address: 75 State Street, Suite 701
Boston, MA 02109
Phone: 617-452-6563
Fax:
Email: JonesNE@cdmsmith.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Ledge Rd Landfill
Project Location: Andover, MA
Project #: 289302
Project Manager: Nathan Jones
ALPHA Quote #:

Turn-Around Time

☐ Standard ☒ RUSH (only confirmed if pre-approved)
Date Due: Time: 1 day

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program: MassDEP Criteria: RCS-1 Soil Standards

MA MCP PRESUMPTIVE CERTAINTY — CT REASONABLE CONFIDENCE PROTO

☒ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☒ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

include petersoncr@cdmsmith on all emails

ANALYSIS — Total Arsenic

SAMPLE HANDLING
Filtration
☐ Done
☒ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	Total Arsenic	Sample Specific Comments	TOTAL # BOTTLES
14089-02	WE-5-SW-2-MSD	~~3/13/24~~ 3/13/24	1310	SO	KG	X		
-10	WE-5-B-1	"	1445	SO	"	"		
11	WE-5-B-2	"	1450	"	"	"		
12	WE-5-B-3	"	1455	"	"	"		
13	WE-5-B-4	"	1500	"	"	"		
14	WE-5-B-5	"	1505	"	"	"		
15	Dup 6	"	—	"	"	"		

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP or CT RCP?

Container Type
Preservative

Relinquished By:	Date/Time	Received By:	Date/Time
	3/14/24 1630		3/14/24 1630
	3/14/24 2005		3/14/24 2005

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

(FORM NO: 01-01 (rev. 16-Jan-2015))

ANALYTICAL REPORT

Lab Number:	L2414646
Client:	CDM Smith, Inc. 75 State Street Suite 701 Boston, MA 02109
ATTN:	Nathan Jones
Phone:	(617) 452-6563
Project Name:	LEDGE RD LANDFILL
Project Number:	289302
Report Date:	03/19/24

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414646
Report Date: 03/19/24

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2414646-01	WE-5-SW-2A	SOIL	ANDOVER, MA	03/18/24 11:45	03/18/24
L2414646-02	WE-5-SW-3A	SOIL	ANDOVER, MA	03/18/24 11:50	03/18/24
L2414646-03	WE-5-SW-5A	SOIL	ANDOVER, MA	03/18/24 11:55	03/18/24
L2414646-04	WE-5-SW-6A	SOIL	ANDOVER, MA	03/18/24 12:00	03/18/24
L2414646-05	WE-5-BSW-1	SOIL	ANDOVER, MA	03/18/24 12:05	03/18/24
L2414646-06	WE-5-BSW-2	SOIL	ANDOVER, MA	03/18/24 12:10	03/18/24
L2414646-07	WE-5-SW-21	SOIL	ANDOVER, MA	03/18/24 14:30	03/18/24
L2414646-08	WE-5-SW-20	SOIL	ANDOVER, MA	03/18/24 14:35	03/18/24
L2414646-09	WE-5-SW-19	SOIL	ANDOVER, MA	03/18/24 14:40	03/18/24
L2414646-10	WE-5-SW-18	SOIL	ANDOVER, MA	03/18/24 14:45	03/18/24
L2414646-11	WE-5-SW-17	SOIL	ANDOVER, MA	03/18/24 14:50	03/18/24
L2414646-12	WE-5-SW-16	SOIL	ANDOVER, MA	03/18/24 14:55	03/18/24
L2414646-13	WE-5-SW-15	SOIL	ANDOVER, MA	03/18/24 15:00	03/18/24
L2414646-14	DUPE 7	SOIL	ANDOVER, MA	03/18/24 00:00	03/18/24

Project Name: LEDGE RD LANDFILL **Lab Number:** L2414646

Project Number: 289302 **Report Date:** 03/19/24

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	NO

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2414646
Project Number:	289302	**Report Date:**	03/19/24

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2414646
Project Number:	289302	**Report Date:**	03/19/24

Case Narrative (continued)

MCP Related Narratives

Total Metals

L2414646-01 through -14: The sample has an elevated detection limit for arsenic, due to the dilution required by the sample matrix.

In reference to question H:

The WG1897743-4/-5 MS/MSD recoveries, performed on L2414646-09, are outside the acceptance criteria for arsenic (168%/198%). Re-analysis of the MS/MSD yielded unacceptable recoveries for arsenic in the range of 30-74% or >125%. The LCS/LCSD recoveries are acceptable; therefore, no further action was taken.

In reference to question I:

All samples were analyzed for a subset of MCP analytes per client request.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Kelly O'Neill

Title: Technical Director/Representative Date: 03/19/24

QC OUTLIER SUMMARY REPORT

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414646
Report Date: 03/19/24

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment
MCP Total Metals - Mansfield Lab								
6010D	Batch QC (L2414646-09)	WG1897743-4	Arsenic, Total	MS	168	75-125	01-14	potential high bias
6010D	Batch QC (L2414646-09)	WG1897743-5	Arsenic, Total	MSD	198	75-125	01-14	potential high bias

METALS

Project Name: LEDGE RD LANDFILL
Lab Number: L2414646
Project Number: 289302
Report Date: 03/19/24

SAMPLE RESULTS

Lab ID: L2414646-01
Client ID: WE-5-SW-2A
Sample Location: ANDOVER, MA
Date Collected: 03/18/24 11:45
Date Received: 03/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 11%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	111		mg/kg	6.76	--	2	03/19/24 00:22	03/19/24 10:41	EPA 3050B	97,6010D	JMF

Project Name: LEDGE RD LANDFILL
Lab Number: L2414646
Project Number: 289302
Report Date: 03/19/24

SAMPLE RESULTS

Lab ID: L2414646-02
Client ID: WE-5-SW-3A
Sample Location: ANDOVER, MA
Date Collected: 03/18/24 11:50
Date Received: 03/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 14%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	1260		mg/kg	5.42	--	2	03/19/24 00:22	03/19/24 10:45	EPA 3050B	97,6010D	JMF

Project Name: LEDGE RD LANDFILL
Lab Number: L2414646
Project Number: 289302
Report Date: 03/19/24

SAMPLE RESULTS

Lab ID: L2414646-03
Client ID: WE-5-SW-5A
Sample Location: ANDOVER, MA
Date Collected: 03/18/24 11:55
Date Received: 03/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 20%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	1280		mg/kg	19.6	--	10	03/19/24 00:22	03/19/24 12:10	EPA 3050B	97,6010D	JMF

Project Name: LEDGE RD LANDFILL
Lab Number: L2414646
Project Number: 289302
Report Date: 03/19/24

SAMPLE RESULTS

Lab ID: L2414646-04
Client ID: WE-5-SW-6A
Sample Location: ANDOVER, MA
Date Collected: 03/18/24 12:00
Date Received: 03/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 22%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	2820		mg/kg	18.2	--	10	03/19/24 00:22	03/19/24 12:14	EPA 3050B	97,6010D	JMF

Project Name: LEDGE RD LANDFILL
Lab Number: L2414646
Project Number: 289302
Report Date: 03/19/24

SAMPLE RESULTS

Lab ID: L2414646-05
Client ID: WE-5-BSW-1
Sample Location: ANDOVER, MA
Date Collected: 03/18/24 12:05
Date Received: 03/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 73%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	130		mg/kg	1.06	--	2	03/19/24 00:22	03/19/24 10:56	EPA 3050B	97,6010D	JMF

Project Name: LEDGE RD LANDFILL
Lab Number: L2414646
Project Number: 289302
Report Date: 03/19/24

SAMPLE RESULTS

Lab ID: L2414646-06
Client ID: WE-5-BSW-2
Sample Location: ANDOVER, MA
Date Collected: 03/18/24 12:10
Date Received: 03/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 29%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	984		mg/kg	2.65	--	2	03/19/24 00:22	03/19/24 10:59	EPA 3050B	97,6010D	JMF

Project Name: LEDGE RD LANDFILL
Lab Number: L2414646
Project Number: 289302
Report Date: 03/19/24

SAMPLE RESULTS

Lab ID: L2414646-07
Client ID: WE-5-SW-21
Sample Location: ANDOVER, MA
Date Collected: 03/18/24 14:30
Date Received: 03/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 19%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	465		mg/kg	4.14	--	2	03/19/24 00:22	03/19/24 11:03	EPA 3050B	97,6010D	JMF

Project Name: LEDGE RD LANDFILL
Lab Number: L2414646
Project Number: 289302
Report Date: 03/19/24

SAMPLE RESULTS

Lab ID: L2414646-08
Client ID: WE-5-SW-20
Sample Location: ANDOVER, MA
Date Collected: 03/18/24 14:35
Date Received: 03/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 34%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	120		mg/kg	2.22	--	2	03/19/24 00:22	03/19/24 11:07	EPA 3050B	97,6010D	JMF

Project Name: LEDGE RD LANDFILL
Lab Number: L2414646
Project Number: 289302
Report Date: 03/19/24

SAMPLE RESULTS

Lab ID: L2414646-09
Client ID: WE-5-SW-19
Sample Location: ANDOVER, MA
Date Collected: 03/18/24 14:40
Date Received: 03/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 36%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	149		mg/kg	5.43	--	5	03/19/24 00:22	03/19/24 11:36	EPA 3050B	97,6010D	JMF

Project Name: LEDGE RD LANDFILL
Lab Number: L2414646
Project Number: 289302
Report Date: 03/19/24

SAMPLE RESULTS

Lab ID: L2414646-10
Client ID: WE-5-SW-18
Sample Location: ANDOVER, MA
Date Collected: 03/18/24 14:45
Date Received: 03/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 27%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	271		mg/kg	14.8	--	10	03/19/24 00:22	03/19/24 12:17	EPA 3050B	97,6010D	JMF

Project Name: LEDGE RD LANDFILL
Lab Number: L2414646
Project Number: 289302
Report Date: 03/19/24

SAMPLE RESULTS

Lab ID: L2414646-11
Client ID: WE-5-SW-17
Sample Location: ANDOVER, MA
Date Collected: 03/18/24 14:50
Date Received: 03/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 28%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	171		mg/kg	2.81	--	2	03/19/24 00:22	03/19/24 11:14	EPA 3050B	97,6010D	JMF

Project Name: LEDGE RD LANDFILL
Lab Number: L2414646
Project Number: 289302
Report Date: 03/19/24

SAMPLE RESULTS

Lab ID: L2414646-12
Client ID: WE-5-SW-16
Sample Location: ANDOVER, MA
Date Collected: 03/18/24 14:55
Date Received: 03/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 43%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	76.8		mg/kg	1.80	--	2	03/19/24 00:22	03/19/24 11:25	EPA 3050B	97,6010D	JMF

Project Name: LEDGE RD LANDFILL
Lab Number: L2414646
Project Number: 289302
Report Date: 03/19/24

SAMPLE RESULTS

Lab ID: L2414646-13
Client ID: WE-5-SW-15
Sample Location: ANDOVER, MA
Date Collected: 03/18/24 15:00
Date Received: 03/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 25%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	196		mg/kg	3.24	--	2	03/19/24 00:22	03/19/24 11:29	EPA 3050B	97,6010D	JMF

Project Name: LEDGE RD LANDFILL
Lab Number: L2414646
Project Number: 289302
Report Date: 03/19/24

SAMPLE RESULTS

Lab ID: L2414646-14
Client ID: DUPE 7
Sample Location: ANDOVER, MA
Date Collected: 03/18/24 00:00
Date Received: 03/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 31%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	116		mg/kg	2.44	--	2	03/19/24 00:22	03/19/24 11:32	EPA 3050B	97,6010D	JMF

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2414646
Report Date: 03/19/24

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-14 Batch: WG1897743-1										
Arsenic, Total	ND		mg/kg	0.400	--	1	03/19/24 00:22	03/19/24 09:55	97,6010D	JMF

Prep Information

Digestion Method: EPA 3050B

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2414646

Report Date: 03/19/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-14 Batch: WG1897743-2 WG1897743-3 SRM Lot Number: D123-540								
Arsenic, Total	93		94		82-118	1		30

Matrix Spike Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414646
Report Date: 03/19/24

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-14 QC Batch ID: WG1897743-4 WG1897743-5 QC Sample: L2414646-09 Client ID: WE-5-SW-19												
Arsenic, Total	149	25.6	192	**168**	Q	199	**198**	Q	75-125	6		35

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Serial Dilution Analysis
Batch Quality Control

Lab Number: L2414646
Report Date: 03/19/24

Parameter	Native Sample	Serial Dilution	Units	% D	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-14 QC Batch ID: WG1897743-6 QC Sample: L2414646-09 Client ID: WE-5-SW-19						
Arsenic, Total	149	146	mg/kg	2		20

INORGANICS
&
MISCELLANEOUS

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414646
Report Date: 03/19/24

SAMPLE RESULTS

Lab ID: L2414646-01
Client ID: WE-5-SW-2A
Sample Location: ANDOVER, MA

Date Collected: 03/18/24 11:45
Date Received: 03/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	11.4		%	0.100	NA	1	-	03/19/24 00:51	121,2540G	ODJ

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414646
Report Date: 03/19/24

SAMPLE RESULTS

Lab ID: L2414646-02
Client ID: WE-5-SW-3A
Sample Location: ANDOVER, MA

Date Collected: 03/18/24 11:50
Date Received: 03/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	14.1		%	0.100	NA	1	-	03/19/24 00:51	121,2540G	ODJ

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414646
Report Date: 03/19/24

SAMPLE RESULTS

Lab ID: L2414646-03
Client ID: WE-5-SW-5A
Sample Location: ANDOVER, MA

Date Collected: 03/18/24 11:55
Date Received: 03/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	19.6		%	0.100	NA	1	-	03/19/24 00:51	121,2540G	ODJ

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414646
Report Date: 03/19/24

SAMPLE RESULTS

Lab ID: L2414646-04
Client ID: WE-5-SW-6A
Sample Location: ANDOVER, MA

Date Collected: 03/18/24 12:00
Date Received: 03/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	21.5		%	0.100	NA	1	-	03/19/24 00:51	121,2540G	ODJ

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414646
Report Date: 03/19/24

SAMPLE RESULTS

Lab ID: L2414646-05
Client ID: WE-5-BSW-1
Sample Location: ANDOVER, MA

Date Collected: 03/18/24 12:05
Date Received: 03/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	72.8		%	0.100	NA	1	-	03/19/24 00:51	121,2540G	ODJ

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414646
Report Date: 03/19/24

SAMPLE RESULTS

Lab ID: L2414646-06
Client ID: WE-5-BSW-2
Sample Location: ANDOVER, MA

Date Collected: 03/18/24 12:10
Date Received: 03/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	28.5		%	0.100	NA	1	-	03/19/24 00:51	121,2540G	ODJ

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414646
Report Date: 03/19/24

SAMPLE RESULTS

Lab ID: L2414646-07
Client ID: WE-5-SW-21
Sample Location: ANDOVER, MA

Date Collected: 03/18/24 14:30
Date Received: 03/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	18.8		%	0.100	NA	1	-	03/19/24 00:51	121,2540G	ODJ

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414646
Report Date: 03/19/24

SAMPLE RESULTS

Lab ID: L2414646-08
Client ID: WE-5-SW-20
Sample Location: ANDOVER, MA

Date Collected: 03/18/24 14:35
Date Received: 03/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	34.4		%	0.100	NA	1	-	03/19/24 00:51	121,2540G	ODJ

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414646
Report Date: 03/19/24

SAMPLE RESULTS

Lab ID: L2414646-09
Client ID: WE-5-SW-19
Sample Location: ANDOVER, MA

Date Collected: 03/18/24 14:40
Date Received: 03/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	36.2		%	0.100	NA	1	-	03/19/24 00:51	121,2540G	ODJ

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414646
Report Date: 03/19/24

SAMPLE RESULTS

Lab ID: L2414646-10
Client ID: WE-5-SW-18
Sample Location: ANDOVER, MA

Date Collected: 03/18/24 14:45
Date Received: 03/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	26.5		%	0.100	NA	1	-	03/19/24 00:51	121,2540G	ODJ

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414646
Report Date: 03/19/24

SAMPLE RESULTS

Lab ID: L2414646-11
Client ID: WE-5-SW-17
Sample Location: ANDOVER, MA

Date Collected: 03/18/24 14:50
Date Received: 03/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	27.8		%	0.100	NA	1	-	03/19/24 00:51	121,2540G	ODJ

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414646
Report Date: 03/19/24

SAMPLE RESULTS

Lab ID: L2414646-12
Client ID: WE-5-SW-16
Sample Location: ANDOVER, MA

Date Collected: 03/18/24 14:55
Date Received: 03/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	42.8		%	0.100	NA	1	-	03/19/24 00:51	121,2540G	ODJ

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414646
Report Date: 03/19/24

SAMPLE RESULTS

Lab ID: L2414646-13
Client ID: WE-5-SW-15
Sample Location: ANDOVER, MA

Date Collected: 03/18/24 15:00
Date Received: 03/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	24.5		%	0.100	NA	1	-	03/19/24 00:51	121,2540G	ODJ

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414646
Report Date: 03/19/24

SAMPLE RESULTS

Lab ID: L2414646-14
Client ID: DUPE 7
Sample Location: ANDOVER, MA

Date Collected: 03/18/24 00:00
Date Received: 03/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	31.2		%	0.100	NA	1	-	03/19/24 00:51	121,2540G	ODJ

Lab Duplicate Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2414646

Report Date: 03/19/24

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-14 QC Batch ID: WG1897770-1 QC Sample: L2414646-09 Client ID: WE-5-SW-19						
Solids, Total	36.2	35.7	%	1		20

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414646
Report Date: 03/19/24

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2414646-01A	Plastic 2oz unpreserved for TS	A	NA		4.8	Y	Absent		TS(7)
L2414646-01B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.8	Y	Absent		MCP-AS-6010T-10(180)
L2414646-02A	Plastic 2oz unpreserved for TS	A	NA		4.8	Y	Absent		TS(7)
L2414646-02B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.8	Y	Absent		MCP-AS-6010T-10(180)
L2414646-03A	Plastic 2oz unpreserved for TS	A	NA		4.8	Y	Absent		TS(7)
L2414646-03B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.8	Y	Absent		MCP-AS-6010T-10(180)
L2414646-04A	Plastic 2oz unpreserved for TS	A	NA		4.8	Y	Absent		TS(7)
L2414646-04B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.8	Y	Absent		MCP-AS-6010T-10(180)
L2414646-05A	Plastic 2oz unpreserved for TS	A	NA		4.8	Y	Absent		TS(7)
L2414646-05B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.8	Y	Absent		MCP-AS-6010T-10(180)
L2414646-06A	Plastic 2oz unpreserved for TS	A	NA		4.8	Y	Absent		TS(7)
L2414646-06B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.8	Y	Absent		MCP-AS-6010T-10(180)
L2414646-07A	Plastic 2oz unpreserved for TS	A	NA		4.8	Y	Absent		TS(7)
L2414646-07B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.8	Y	Absent		MCP-AS-6010T-10(180)
L2414646-08A	Plastic 2oz unpreserved for TS	A	NA		4.8	Y	Absent		TS(7)
L2414646-08B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.8	Y	Absent		MCP-AS-6010T-10(180)
L2414646-09A	Plastic 2oz unpreserved for TS	A	NA		4.8	Y	Absent		TS(7)
L2414646-09A1	Plastic 2oz unpreserved for TS	A	NA		4.8	Y	Absent		TS(7)
L2414646-09A2	Plastic 2oz unpreserved for TS	A	NA		4.8	Y	Absent		TS(7)
L2414646-09B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.8	Y	Absent		MCP-AS-6010T-10(180)
L2414646-09B1	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.8	Y	Absent		MCP-AS-6010T-10(180)
L2414646-09B2	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.8	Y	Absent		MCP-AS-6010T-10(180)
L2414646-10A	Plastic 2oz unpreserved for TS	A	NA		4.8	Y	Absent		TS(7)

*Values in parentheses indicate holding time in days

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414646
Report Date: 03/19/24

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2414646-10B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.8	Y	Absent		MCP-AS-6010T-10(180)
L2414646-11A	Plastic 2oz unpreserved for TS	A	NA		4.8	Y	Absent		TS(7)
L2414646-11B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.8	Y	Absent		MCP-AS-6010T-10(180)
L2414646-12A	Plastic 2oz unpreserved for TS	A	NA		4.8	Y	Absent		TS(7)
L2414646-12B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.8	Y	Absent		MCP-AS-6010T-10(180)
L2414646-13A	Plastic 2oz unpreserved for TS	A	NA		4.8	Y	Absent		TS(7)
L2414646-13B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.8	Y	Absent		MCP-AS-6010T-10(180)
L2414646-14A	Plastic 2oz unpreserved for TS	A	NA		4.8	Y	Absent		TS(7)
L2414646-14B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.8	Y	Absent		MCP-AS-6010T-10(180)

*Values in parentheses indicate holding time in days

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2414646
Project Number:	289302	**Report Date:**	03/19/24

GLOSSARY

Acronyms

DL - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EMPC - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LOD - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

LOQ - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

NR - No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TEF - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.

TEQ - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2414646
Project Number:	289302	**Report Date:**	03/19/24

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2414646
Project Number:	289302	**Report Date:**	03/19/24

Data Qualifiers

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: Data Usability Report

REFERENCES

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010; WSC-CAM-IIIA and IIID, January 2024; and WSC-CAM-IIIB and VA, February 2024.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 2

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 03/18/24

ALPHA Job #: L2414646

Client Information

Client: CDM Smith
Address: 75 State Street, Suite 701
Boston, MA 02109
Phone: 617-452-6563
Fax:
Email: JonesNE@cdmsmith.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Ledge Rd Landfill
Project Location: Andover, MA
Project #: 289302
Project Manager: Nathan Jones
ALPHA Quote #:

Turn-Around Time

☐ Standard ☒ RUSH (only confirmed if pre-approved)
Date Due: Time: 1 day

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program: MassDEP Criteria: RCS-1 Soil Standards

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

☒ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☒ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

include petersoncr@cdmsmith on all emails

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	ANALYSIS: Total Arsenic	SAMPLE HANDLING	TOTAL # BOTTLES
14646-01	WE-5-SW-2A	3/18/24	11:45	SO	KG	X		
-02	WE-5-SW-3A		11:50	SO				
-03	WE-5-SW-5A		11:55					
-04	WE-5-SW-6A		12:00					
-05	WE-5-BSW-1		12:05					
-06	WE-5-BSW-2		12:10					
-07	WE-5-SW-21		14:30					
-08	WE-5-SW-20		14:35					
-09	WE-5-SW-19		14:40					
-10	WE-5-SW-18	↓	14:45	↓	↓	↓		

SAMPLE HANDLING
Filtration
☐ Done
☒ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

Sample Specific Comments

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP or CT RCP?

	Container Type										
	Preservative										

Relinquished By:	Date/Time	Received By:	Date/Time
	3/18/24 16:00		3/18 16:10
	3/18 17:10		3/18 17:10

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 18-Jan-2010)

CHAIN OF CUSTODY

PAGE 2 OF 2

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 03/18/24

ALPHA Job #: L2414646

Client Information

Client: CDM Smith
Address: 75 State Street, Suite 701
Boston, MA 02109
Phone: 617-452-6563
Fax:
Email: JonesNE@cdmsmith.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Ledge Rd Landfill
Project Location: Andover, MA
Project #: 289302
Project Manager: Nathan Jones
ALPHA Quote #:

Turn-Around Time

☐ Standard ☒ RUSH (only confirmed if pre-approved)
Date Due: Time: 1 day

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client Info PO #:

Regulatory Requirements/Report Limits

State /Fed Program: MassDEP Criteria: RCS-1 Soil Standards

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

☒ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☒ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

include petersoncr@cdmsmith on all emails

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	ANALYSIS: Total Arsenic	SAMPLE HANDLING	TOTAL # BOTTLES
14646-11	WE-S-SW-17	3/18/24	14:50	SO	KG	X		
-12	WE-S-SW-16		14:55	SO				
-13	WE-S-SW-15		15:00					
-14	Dup: 7		—					
-09 -15	WE-S-SW-19-MS		14:40					
-09 -16	WE-S-SW-19-MSD		14:40					

SAMPLE HANDLING
Filtration
☐ Done
☒ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

Sample Specific Comments

DEM

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP or CT RCP?

	Container Type																			
	Preservative																			

Relinquished By:	Date/Time	Received By:	Date/Time
Kevin Griffith	3/19/24 16:00		
Stephen Mason	3/18 17:10		3/18 16:16 3/18 17:10

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 18-Jan-2013)

ANALYTICAL REPORT

Lab Number:	L2414978
Client:	CDM Smith, Inc. 75 State Street Suite 701 Boston, MA 02109
ATTN:	Nathan Jones
Phone:	(617) 452-6563
Project Name:	LEDGE RD LANDFILL
Project Number:	289302
Report Date:	03/20/24

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414978
Report Date: 03/20/24

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2414978-01	WE-5-B-6	SOIL	ANDOVER, MA	03/19/24 11:30	03/19/24
L2414978-02	WE-5-B-7	SOIL	ANDOVER, MA	03/19/24 11:35	03/19/24
L2414978-03	WE-5-B-8	SOIL	ANDOVER, MA	03/19/24 11:40	03/19/24
L2414978-04	WE-5-B-9	SOIL	ANDOVER, MA	03/19/24 11:45	03/19/24
L2414978-05	WE-5-B-10	SOIL	ANDOVER, MA	03/19/24 11:50	03/19/24
L2414978-06	WE-5-B-11	SOIL	ANDOVER, MA	03/19/24 11:55	03/19/24
L2414978-07	WE-5-B-12	SOIL	ANDOVER, MA	03/19/24 12:40	03/19/24
L2414978-08	WE-5-B-13	SOIL	ANDOVER, MA	03/19/24 12:45	03/19/24
L2414978-09	WE-5-B-14	SOIL	ANDOVER, MA	03/19/24 12:50	03/19/24
L2414978-10	WE-5-B-3-1	SOIL	ANDOVER, MA	03/19/24 12:55	03/19/24
L2414978-11	WE-5-B-3-2	SOIL	ANDOVER, MA	03/19/24 13:00	03/19/24
L2414978-12	WE-5-B-3-3	SOIL	ANDOVER, MA	03/19/24 13:05	03/19/24
L2414978-13	WE-5-SW-14	SOIL	ANDOVER, MA	03/19/24 14:30	03/19/24
L2414978-14	WE-5-SW-13	SOIL	ANDOVER, MA	03/19/24 14:35	03/19/24
L2414978-15	WE-5-SW-12	SOIL	ANDOVER, MA	03/19/24 14:40	03/19/24
L2414978-16	WE-5-SW-11	SOIL	ANDOVER, MA	03/19/24 14:45	03/19/24
L2414978-17	WE-5-SW-10	SOIL	ANDOVER, MA	03/19/24 14:50	03/19/24
L2414978-18	WE-5-SW-9	SOIL	ANDOVER, MA	03/19/24 14:55	03/19/24
L2414978-19	WE-5-SW-5-B	SOIL	ANDOVER, MA	03/19/24 14:10	03/19/24
L2414978-20	WE-5-SW-6-B	SOIL	ANDOVER, MA	03/19/24 14:15	03/19/24
L2414978-21	DUPE 8	SOIL	ANDOVER, MA	03/19/24 00:00	03/19/24

Project Name: LEDGE RD LANDFILL **Lab Number:** L2414978

Project Number: 289302 **Report Date:** 03/20/24

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	NO

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2414978
Project Number:	289302	**Report Date:**	03/20/24

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2414978
Project Number:	289302	**Report Date:**	03/20/24

Case Narrative (continued)

MCP Related Narratives

Sample Receipt

In reference to question H:

A Matrix Spike was not submitted for the analysis of Total Metals.

Total Metals

L2414978-01 through -21: The sample has an elevated detection limit due to the dilution required by the sample matrix.

In reference to question I:

All samples were analyzed for a subset of MCP analytes per client request.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Michelle M. Morris

Title: Technical Director/Representative Date: 03/20/24

QC OUTLIER SUMMARY REPORT

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414978
Report Date: 03/20/24

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment

There are no QC Outliers associated with this report.

METALS

Project Name: LEDGE RD LANDFILL
Lab Number: L2414978
Project Number: 289302
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-01
Client ID: WE-5-B-6
Sample Location: ANDOVER, MA
Date Collected: 03/19/24 11:30
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 48%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	99.8		mg/kg	1.64	--	2	03/20/24 07:00	03/20/24 11:43	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2414978
Project Number: 289302
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-02
Client ID: WE-5-B-7
Sample Location: ANDOVER, MA
Date Collected: 03/19/24 11:35
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 68%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	45.0		mg/kg	1.12	--	2	03/20/24 07:00	03/20/24 11:48	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2414978
Project Number: 289302
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-03
Client ID: WE-5-B-8
Sample Location: ANDOVER, MA
Date Collected: 03/19/24 11:40
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 76%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	63.3		mg/kg	1.03	--	2	03/20/24 07:00	03/20/24 11:52	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2414978
Project Number: 289302
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-04
Client ID: WE-5-B-9
Sample Location: ANDOVER, MA
Date Collected: 03/19/24 11:45
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 67%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	52.0		mg/kg	1.17	--	2	03/20/24 07:00	03/20/24 12:24	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2414978
Project Number: 289302
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-05
Client ID: WE-5-B-10
Sample Location: ANDOVER, MA
Date Collected: 03/19/24 11:50
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 67%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	56.6		mg/kg	1.13	--	2	03/20/24 07:00	03/20/24 12:32	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2414978
Project Number: 289302
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-06
Client ID: WE-5-B-11
Sample Location: ANDOVER, MA
Date Collected: 03/19/24 11:55
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 70%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	91.2		mg/kg	1.12	--	2	03/20/24 07:00	03/20/24 12:36	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2414978
Project Number: 289302
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-07
Client ID: WE-5-B-12
Sample Location: ANDOVER, MA
Date Collected: 03/19/24 12:40
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 67%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	22.0		mg/kg	1.13	--	2	03/20/24 07:00	03/20/24 12:41	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2414978
Project Number: 289302
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-08
Client ID: WE-5-B-13
Sample Location: ANDOVER, MA
Date Collected: 03/19/24 12:45
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 75%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	19.1		mg/kg	1.02	--	2	03/20/24 07:00	03/20/24 12:45	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2414978
Project Number: 289302
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-09
Client ID: WE-5-B-14
Sample Location: ANDOVER, MA
Date Collected: 03/19/24 12:50
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 65%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	39.5		mg/kg	1.16	--	2	03/20/24 07:00	03/20/24 12:49	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2414978
Project Number: 289302
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-10
Client ID: WE-5-B-3-1
Sample Location: ANDOVER, MA
Date Collected: 03/19/24 12:55
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 62%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	142		mg/kg	1.25	--	2	03/20/24 07:00	03/20/24 12:53	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2414978
Project Number: 289302
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-11
Client ID: WE-5-B-3-2
Sample Location: ANDOVER, MA
Date Collected: 03/19/24 13:00
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 62%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	150		mg/kg	1.23	--	2	03/20/24 07:00	03/20/24 12:58	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2414978
Project Number: 289302
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-12
Client ID: WE-5-B-3-3
Sample Location: ANDOVER, MA
Date Collected: 03/19/24 13:05
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 48%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	62.4		mg/kg	1.57	--	2	03/20/24 07:00	03/20/24 13:02	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2414978
Project Number: 289302
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-13
Client ID: WE-5-SW-14
Sample Location: ANDOVER, MA
Date Collected: 03/19/24 14:30
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 40%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	78.5		mg/kg	1.97	--	2	03/20/24 07:00	03/20/24 13:06	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2414978
Project Number: 289302
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-14
Client ID: WE-5-SW-13
Sample Location: ANDOVER, MA
Date Collected: 03/19/24 14:35
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 34%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	62.0		mg/kg	2.29	--	2	03/20/24 07:00	03/20/24 13:20	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2414978
Project Number: 289302
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-15
Client ID: WE-5-SW-12
Sample Location: ANDOVER, MA
Date Collected: 03/19/24 14:40
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 19%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	424		mg/kg	4.21	--	2	03/20/24 07:00	03/20/24 13:25	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2414978
Project Number: 289302
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-16
Client ID: WE-5-SW-11
Sample Location: ANDOVER, MA
Date Collected: 03/19/24 14:45
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 43%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	228		mg/kg	1.80	--	2	03/20/24 07:00	03/20/24 13:29	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2414978
Project Number: 289302
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-17
Client ID: WE-5-SW-10
Sample Location: ANDOVER, MA
Date Collected: 03/19/24 14:50
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 28%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	134		mg/kg	2.78	--	2	03/20/24 07:00	03/20/24 13:33	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2414978
Project Number: 289302
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-18
Client ID: WE-5-SW-9
Sample Location: ANDOVER, MA
Date Collected: 03/19/24 14:55
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 34%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	267		mg/kg	2.31	--	2	03/20/24 07:00	03/20/24 13:38	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2414978
Project Number: 289302
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-19
Client ID: WE-5-SW-5-B
Sample Location: ANDOVER, MA
Date Collected: 03/19/24 14:10
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 17%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	2700		mg/kg	8.84	--	4	03/20/24 07:00	03/20/24 15:22	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2414978
Project Number: 289302
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-20
Client ID: WE-5-SW-6-B
Sample Location: ANDOVER, MA
Date Collected: 03/19/24 14:15
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 26%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	1100		mg/kg	14.7	--	10	03/20/24 07:00	03/20/24 15:26	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2414978
Project Number: 289302
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-21
Client ID: DUPE 8
Sample Location: ANDOVER, MA
Date Collected: 03/19/24 00:00
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 48%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	60.7		mg/kg	1.58	--	2	03/20/24 07:30	03/20/24 13:39	EPA 3050B	97,6010D	JMF

Project Name: LEDGE RD LANDFILL **Lab Number:** L2414978

Project Number: 289302 **Report Date:** 03/20/24

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-20 Batch: WG1898311-1										
Arsenic, Total	ND		mg/kg	0.400	--	1	03/20/24 07:00	03/20/24 11:30	97,6010D	DHL

Prep Information

Digestion Method: EPA 3050B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 21 Batch: WG1898313-1										
Arsenic, Total	ND		mg/kg	0.400	--	1	03/20/24 07:30	03/20/24 13:28	97,6010D	JMF

Prep Information

Digestion Method: EPA 3050B

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2414978

Report Date: 03/20/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-20 Batch: WG1898311-2 WG1898311-3 SRM Lot Number: D123-540								
Arsenic, Total	104		89		82-118	16		30
MCP Total Metals - Mansfield Lab Associated sample(s): 21 Batch: WG1898313-2 WG1898313-3 SRM Lot Number: D123-540								
Arsenic, Total	94		95		82-118	1		30

INORGANICS
&
MISCELLANEOUS

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414978
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-01
Client ID: WE-5-B-6
Sample Location: ANDOVER, MA

Date Collected: 03/19/24 11:30
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	47.5		%	0.100	NA	1	-	03/19/24 21:23	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414978
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-02
Client ID: WE-5-B-7
Sample Location: ANDOVER, MA

Date Collected: 03/19/24 11:35
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	68.4		%	0.100	NA	1	-	03/19/24 21:23	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414978
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-03
Client ID: WE-5-B-8
Sample Location: ANDOVER, MA

Date Collected: 03/19/24 11:40
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	75.6		%	0.100	NA	1	-	03/19/24 21:23	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414978
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-04
Client ID: WE-5-B-9
Sample Location: ANDOVER, MA

Date Collected: 03/19/24 11:45
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	66.7		%	0.100	NA	1	-	03/19/24 21:23	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414978
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-05
Client ID: WE-5-B-10
Sample Location: ANDOVER, MA

Date Collected: 03/19/24 11:50
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	67.2		%	0.100	NA	1	-	03/19/24 21:23	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414978
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-06
Client ID: WE-5-B-11
Sample Location: ANDOVER, MA

Date Collected: 03/19/24 11:55
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	70.0		%	0.100	NA	1	-	03/19/24 21:23	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414978
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-07
Client ID: WE-5-B-12
Sample Location: ANDOVER, MA

Date Collected: 03/19/24 12:40
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	67.3		%	0.100	NA	1	-	03/19/24 21:23	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414978
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-08
Client ID: WE-5-B-13
Sample Location: ANDOVER, MA

Date Collected: 03/19/24 12:45
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	75.2		%	0.100	NA	1	-	03/19/24 21:23	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414978
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-09
Client ID: WE-5-B-14
Sample Location: ANDOVER, MA

Date Collected: 03/19/24 12:50
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	65.1		%	0.100	NA	1	-	03/19/24 21:23	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414978
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-10
Client ID: WE-5-B-3-1
Sample Location: ANDOVER, MA

Date Collected: 03/19/24 12:55
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	62.0		%	0.100	NA	1	-	03/19/24 21:23	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414978
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-11
Client ID: WE-5-B-3-2
Sample Location: ANDOVER, MA

Date Collected: 03/19/24 13:00
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	62.0		%	0.100	NA	1	-	03/19/24 21:23	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414978
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-12
Client ID: WE-5-B-3-3
Sample Location: ANDOVER, MA

Date Collected: 03/19/24 13:05
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	47.9		%	0.100	NA	1	-	03/19/24 21:23	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414978
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-13
Client ID: WE-5-SW-14
Sample Location: ANDOVER, MA

Date Collected: 03/19/24 14:30
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	39.5		%	0.100	NA	1	-	03/19/24 21:23	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414978
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-14
Client ID: WE-5-SW-13
Sample Location: ANDOVER, MA

Date Collected: 03/19/24 14:35
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	34.4		%	0.100	NA	1	-	03/19/24 21:23	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414978
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-15
Client ID: WE-5-SW-12
Sample Location: ANDOVER, MA

Date Collected: 03/19/24 14:40
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	18.7		%	0.100	NA	1	-	03/19/24 21:23	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414978
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-16
Client ID: WE-5-SW-11
Sample Location: ANDOVER, MA

Date Collected: 03/19/24 14:45
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	43.1		%	0.100	NA	1	-	03/19/24 21:23	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414978
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-17
Client ID: WE-5-SW-10
Sample Location: ANDOVER, MA

Date Collected: 03/19/24 14:50
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	27.9		%	0.100	NA	1	-	03/19/24 21:23	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414978
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-18
Client ID: WE-5-SW-9
Sample Location: ANDOVER, MA

Date Collected: 03/19/24 14:55
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	33.7		%	0.100	NA	1	-	03/19/24 21:23	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414978
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-19
Client ID: WE-5-SW-5-B
Sample Location: ANDOVER, MA

Date Collected: 03/19/24 14:10
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	17.3		%	0.100	NA	1	-	03/19/24 21:23	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414978
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-20
Client ID: WE-5-SW-6-B
Sample Location: ANDOVER, MA

Date Collected: 03/19/24 14:15
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	25.7		%	0.100	NA	1	-	03/19/24 21:23	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414978
Report Date: 03/20/24

SAMPLE RESULTS

Lab ID: L2414978-21
Client ID: DUPE 8
Sample Location: ANDOVER, MA

Date Collected: 03/19/24 00:00
Date Received: 03/19/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	47.9		%	0.100	NA	1	-	03/19/24 22:48	121,2540G	WJM

Lab Duplicate Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2414978

Report Date: 03/20/24

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-20 QC Batch ID: WG1898233-1 QC Sample: L2414978-01 Client ID: WE-5-B-6						
Solids, Total	47.5	46.2	%	3		20

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414978
Report Date: 03/20/24

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2414978-01A	Plastic 2oz unpreserved for TS	A	NA		4.5	Y	Absent		TS(7)
L2414978-01B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.5	Y	Absent		MCP-AS-6010T-10(180)
L2414978-02A	Plastic 2oz unpreserved for TS	A	NA		4.5	Y	Absent		TS(7)
L2414978-02B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.5	Y	Absent		MCP-AS-6010T-10(180)
L2414978-03A	Plastic 2oz unpreserved for TS	A	NA		4.5	Y	Absent		TS(7)
L2414978-03B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.5	Y	Absent		MCP-AS-6010T-10(180)
L2414978-04A	Plastic 2oz unpreserved for TS	A	NA		4.5	Y	Absent		TS(7)
L2414978-04B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.5	Y	Absent		MCP-AS-6010T-10(180)
L2414978-05A	Plastic 2oz unpreserved for TS	A	NA		4.5	Y	Absent		TS(7)
L2414978-05B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.5	Y	Absent		MCP-AS-6010T-10(180)
L2414978-06A	Plastic 2oz unpreserved for TS	A	NA		4.5	Y	Absent		TS(7)
L2414978-06B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.5	Y	Absent		MCP-AS-6010T-10(180)
L2414978-07A	Plastic 2oz unpreserved for TS	A	NA		4.5	Y	Absent		TS(7)
L2414978-07B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.5	Y	Absent		MCP-AS-6010T-10(180)
L2414978-08A	Plastic 2oz unpreserved for TS	A	NA		4.5	Y	Absent		TS(7)
L2414978-08B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.5	Y	Absent		MCP-AS-6010T-10(180)
L2414978-09A	Plastic 2oz unpreserved for TS	A	NA		4.5	Y	Absent		TS(7)
L2414978-09B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.5	Y	Absent		MCP-AS-6010T-10(180)
L2414978-10A	Plastic 2oz unpreserved for TS	A	NA		4.5	Y	Absent		TS(7)
L2414978-10B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.5	Y	Absent		MCP-AS-6010T-10(180)
L2414978-11A	Plastic 2oz unpreserved for TS	A	NA		4.5	Y	Absent		TS(7)
L2414978-11B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.5	Y	Absent		MCP-AS-6010T-10(180)
L2414978-12A	Plastic 2oz unpreserved for TS	A	NA		4.5	Y	Absent		TS(7)

*Values in parentheses indicate holding time in days

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2414978
Report Date: 03/20/24

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2414978-12B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.5	Y	Absent		MCP-AS-6010T-10(180)
L2414978-13A	Plastic 2oz unpreserved for TS	A	NA		4.5	Y	Absent		TS(7)
L2414978-13B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.5	Y	Absent		MCP-AS-6010T-10(180)
L2414978-14A	Plastic 2oz unpreserved for TS	A	NA		4.5	Y	Absent		TS(7)
L2414978-14B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.5	Y	Absent		MCP-AS-6010T-10(180)
L2414978-15A	Plastic 2oz unpreserved for TS	A	NA		4.5	Y	Absent		TS(7)
L2414978-15B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.5	Y	Absent		MCP-AS-6010T-10(180)
L2414978-16A	Plastic 2oz unpreserved for TS	A	NA		4.5	Y	Absent		TS(7)
L2414978-16B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.5	Y	Absent		MCP-AS-6010T-10(180)
L2414978-17A	Plastic 2oz unpreserved for TS	A	NA		4.5	Y	Absent		TS(7)
L2414978-17B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.5	Y	Absent		MCP-AS-6010T-10(180)
L2414978-18A	Plastic 2oz unpreserved for TS	A	NA		4.5	Y	Absent		TS(7)
L2414978-18B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.5	Y	Absent		MCP-AS-6010T-10(180)
L2414978-19A	Plastic 2oz unpreserved for TS	A	NA		4.5	Y	Absent		TS(7)
L2414978-19B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.5	Y	Absent		MCP-AS-6010T-10(180)
L2414978-20A	Plastic 2oz unpreserved for TS	A	NA		4.5	Y	Absent		TS(7)
L2414978-20B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.5	Y	Absent		MCP-AS-6010T-10(180)
L2414978-21A	Plastic 2oz unpreserved for TS	A	NA		4.5	Y	Absent		TS(7)
L2414978-21B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.5	Y	Absent		MCP-AS-6010T-10(180)

*Values in parentheses indicate holding time in days

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2414978
Project Number:	289302	**Report Date:**	03/20/24

GLOSSARY

Acronyms

DL - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EMPC - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LOD - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

LOQ - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

NR - No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TEF - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.

TEQ - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2414978
Project Number:	289302	**Report Date:**	03/20/24

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2414978
Project Number:	289302	**Report Date:**	03/20/24

Data Qualifiers

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: Data Usability Report

REFERENCES

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010; WSC-CAM-IIIA and IIID, January 2024; and WSC-CAM-IIIB and VA, February 2024.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 3

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 03/19/24

ALPHA Job #: L2414978

Client Information

Client: CDM Smith
Address: 75 State Street, Suite 701
Boston, MA 02109
Phone: 617-452-6563
Fax:
Email: JonesNE@cdmsmith.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Ledge Rd Landfill
Project Location: Andover, MA
Project #: 289302
Project Manager: Nathan Jones
ALPHA Quote #:

Turn-Around Time

☐ Standard ☒ RUSH (only confirmed if pre-approved)
Date Due: Time: 1 day

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program: MassDEP Criteria: RCS-1 Soil Standards

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

☒ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☒ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

include petersoncr@cdmsmith on all emails

ANALYSIS: Total Arsenic

SAMPLE HANDLING
Filtration
☐ Done
☒ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	Total Arsenic	Sample Specific Comments	TOTAL # BOTTLES
14978-01	WE-S-B-6	3/19/24	1130	SO	KG	X		
-02	WE-S-B-7		11:35	SO				
-03	WE-S-B-8		11:40					
-04	WE-S-B-9		11:45					
-05	WE-S-B-10		11:50					
-06	WE-S-B-11		11:55					
-07	WE-S-B-12		12:40					
-08	WE-S-B-13		12:45					
-09	WE-S-B-14		12:50					
-10	WE-S-B-3-1	↓	12:55	↓	↓	↓		

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP or CT RCP?

Container Type	
Preservative	

Relinquished By:	Date/Time	Received By:	Date/Time
	3/19 16:15	AAL	3-19-24 1720
	3-19-24 1815		3/19 1815

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 16-Jan-2015)

CHAIN OF CUSTODY

PAGE 2 OF 3

Date Rec'd in Lab: 03/19/24

ALPHA Job #: L2414978

ALPHA ANALYTICAL LABS
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: CDM Smith
Address: 75 State Street, Suite 701
Boston, MA 02109
Phone: 617-452-6563
Fax:
Email: JonesNE@cdmsmith.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Ledge Rd Landfill
Project Location: Andover, MA
Project #: 289302
Project Manager: Nathan Jones
ALPHA Quote #:

Turn-Around Time

☐ Standard ☒ RUSH (only confirmed if pre-approved)
Date Due: Time: 1 day

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program: MassDEP Criteria: RCS-1 Soil Standards

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

☒ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☒ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

include petersoncr@cdmsmith on all emails

ANALYSIS: Total Arsenic

SAMPLE HANDLING
Filtration
☐ Done
☒ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	Total Arsenic	Sample Specific Comments
14978-11	WE-5-B-3-2	3/19/24	13:00	SO	KC	X	
-12	WE-5-B-3-3		13:05	SO			
-13	WE-5-SW-14		14:30				
-14	WE-5-SW-13		14:35				
-15	WE-5-SW-12		14:40				
-16	WE-5-SW-11		14:45				
-17	WE-5-SW-10		14:50				
-18	WE-5-SW-9		14:55				
-19	WE-5-SW-5-B		14:10				
-20	WE-5-SW-6-B		14:15				

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP or CT RCP?

Container Type
Preservative

Relinquished By:	Date/Time	Received By:	Date/Time
AAL	3/19 16:15	AAL	3/19 1710
	3-19 1815		3/19 1815

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO. 01-01 (rev. 16-Jan-2019)

CHAIN OF CUSTODY

PAGE 3 OF 3

Date Rec'd in Lab: 03/19/24

ALPHA Job #: L2414978

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: CDM Smith
Address: 75 State Street, Suite 701
Boston, MA 02109
Phone: 617-452-6563
Fax:
Email: JonesNE@cdmsmith.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Ledge Rd Landfill
Project Location: Andover, MA
Project #: 289302
Project Manager: Nathan Jones
ALPHA Quote #:

Turn-Around Time

☐ Standard ☒ RUSH (only confirmed if pre-approved)
Date Due: Time: 1 day

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program: MassDEP Criteria: RCS-1 Soil Standards

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

☒ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☒ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

include petersoncr@cdmsmith on all emails

ANALYSIS: Total Arsenic

SAMPLE HANDLING
Filtration
☐ Done
☒ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	Total Arsenic	Sample Specific Comments
14978-21	Dupe 8	3/19/24	—	SO	KG	X	
				SO			

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP or CT RCP?

Container Type
Preservative

Relinquished By:	Date/Time	Received By:	Date/Time
AAL	3/19 16:15	AAL	3-19-24 17:10
AAL	3-19 1815		3/19 1815

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

ANALYTICAL REPORT

Lab Number:	L2415255
Client:	CDM Smith, Inc. 75 State Street Suite 701 Boston, MA 02109
ATTN:	Nathan Jones
Phone:	(617) 452-6563
Project Name:	LEDGE RD LANDFILL
Project Number:	289302
Report Date:	03/21/24

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415255
Report Date: 03/21/24

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2415255-01	WE-5-SW-3C (0-0.5)	SOIL	ANDOVER, MA	03/20/24 11:40	03/20/24
L2415255-02	WE-5-SW-3D (0-0.5)	SOIL	ANDOVER, MA	03/20/24 12:15	03/20/24
L2415255-03	WE-5-SW-5C (0-0.5)	SOIL	ANDOVER, MA	03/20/24 13:00	03/20/24
L2415255-04	WE-5-SW-5D (0-0.5)	SOIL	ANDOVER, MA	03/20/24 13:15	03/20/24
L2415255-05	WE-5-SW-5E (0-0.5)	SOIL	ANDOVER, MA	03/20/24 15:00	03/20/24
L2415255-06	WE-5-SW-6C (0-0.5)	SOIL	ANDOVER, MA	03/20/24 13:30	03/20/24
L2415255-07	WE-5-SW-6D (0-0.5)	SOIL	ANDOVER, MA	03/20/24 13:25	03/20/24
L2415255-08	WE-5-SW-6E (0-0.5)	SOIL	ANDOVER, MA	03/20/24 14:15	03/20/24
L2415255-09	WE-5-SW-6F (0-0.5)	SOIL	ANDOVER, MA	03/20/24 14:25	03/20/24
L2415255-10	WE-5-B-3-E (1-1.5)	SOIL	ANDOVER, MA	03/20/24 15:20	03/20/24
L2415255-11	WE-5-B-3-W (1-1.5)	SOIL	ANDOVER, MA	03/20/24 15:30	03/20/24
L2415255-12	WE-5-BSW-2-R (0-0.5)	SOIL	ANDOVER, MA	03/20/24 15:35	03/20/24

Project Name: LEDGE RD LANDFILL **Lab Number:** L2415255

Project Number: 289302 **Report Date:** 03/21/24

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	NO

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2415255
Project Number:	289302	**Report Date:**	03/21/24

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2415255
Project Number:	289302	**Report Date:**	03/21/24

Case Narrative (continued)

MCP Related Narratives

Sample Receipt

In reference to question H:

A Matrix Spike was not submitted for the analysis of Total Metals.

Total Metals

L2415255-01 through -12: The sample has an elevated detection limit for arsenic due to the dilution required by the sample matrix.

In reference to question I:

All samples were analyzed for a subset of MCP analytes per client request.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Caitlin Walukevich Caitlin Walukevich

Title: Technical Director/Representative Date: 03/21/24

QC OUTLIER SUMMARY REPORT

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415255
Report Date: 03/21/24

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment

There are no QC Outliers associated with this report.

METALS

Project Name: LEDGE RD LANDFILL
Lab Number: L2415255
Project Number: 289302
Report Date: 03/21/24

SAMPLE RESULTS

Lab ID: L2415255-01
Client ID: WE-5-SW-3C (0-0.5)
Sample Location: ANDOVER, MA
Date Collected: 03/20/24 11:40
Date Received: 03/20/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 13%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	512		mg/kg	6.13	--	2	03/20/24 23:20	03/21/24 08:38	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL
Lab Number: L2415255
Project Number: 289302
Report Date: 03/21/24

SAMPLE RESULTS

Lab ID: L2415255-02
Client ID: WE-5-SW-3D (0-0.5)
Sample Location: ANDOVER, MA
Date Collected: 03/20/24 12:15
Date Received: 03/20/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 14%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	248		mg/kg	5.47	--	2	03/20/24 23:20	03/21/24 08:44	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL
Lab Number: L2415255
Project Number: 289302
Report Date: 03/21/24

SAMPLE RESULTS

Lab ID: L2415255-03
Client ID: WE-5-SW-5C (0-0.5)
Sample Location: ANDOVER, MA
Date Collected: 03/20/24 13:00
Date Received: 03/20/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 18%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	213		mg/kg	10.7	--	5	03/20/24 23:20	03/21/24 09:41	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL
Lab Number: L2415255
Project Number: 289302
Report Date: 03/21/24

SAMPLE RESULTS

Lab ID: L2415255-04
Client ID: WE-5-SW-5D (0-0.5)
Sample Location: ANDOVER, MA
Date Collected: 03/20/24 13:15
Date Received: 03/20/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 20%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	739		mg/kg	9.65	--	5	03/20/24 23:20	03/21/24 09:46	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL
Lab Number: L2415255
Project Number: 289302
Report Date: 03/21/24

SAMPLE RESULTS

Lab ID: L2415255-06
Client ID: WE-5-SW-6C (0-0.5)
Sample Location: ANDOVER, MA
Date Collected: 03/20/24 13:30
Date Received: 03/20/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 14%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	630		mg/kg	5.52	--	2	03/20/24 23:20	03/21/24 09:00	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL
Lab Number: L2415255
Project Number: 289302
Report Date: 03/21/24

SAMPLE RESULTS

Lab ID: L2415255-07
Client ID: WE-5-SW-6D (0-0.5)
Sample Location: ANDOVER, MA
Date Collected: 03/20/24 13:25
Date Received: 03/20/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 21%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	78.2		mg/kg	3.72	--	2	03/20/24 23:20	03/21/24 09:06	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL
Lab Number: L2415255
Project Number: 289302
Report Date: 03/21/24

SAMPLE RESULTS

Lab ID: L2415255-10
Client ID: WE-5-B-3-E (1-1.5)
Sample Location: ANDOVER, MA
Date Collected: 03/20/24 15:20
Date Received: 03/20/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 61%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	9.57		mg/kg	1.28	--	2	03/20/24 23:20	03/21/24 09:11	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL
Lab Number: L2415255
Project Number: 289302
Report Date: 03/21/24

SAMPLE RESULTS

Lab ID: L2415255-11
Client ID: WE-5-B-3-W (1-1.5)
Sample Location: ANDOVER, MA
Date Collected: 03/20/24 15:30
Date Received: 03/20/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 33%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	110		mg/kg	2.39	--	2	03/20/24 23:20	03/21/24 09:30	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL
Lab Number: L2415255
Project Number: 289302
Report Date: 03/21/24

SAMPLE RESULTS

Lab ID: L2415255-12
Client ID: WE-5-BSW-2-R (0-0.5)
Sample Location: ANDOVER, MA
Date Collected: 03/20/24 15:35
Date Received: 03/20/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 32%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	1070		mg/kg	2.46	--	2	03/20/24 23:20	03/21/24 09:35	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL **Lab Number:** L2415255

Project Number: 289302 **Report Date:** 03/21/24

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-04,06-07,10-12 Batch: WG1898769-1										
Arsenic, Total	ND		mg/kg	0.400	--	1	03/20/24 23:20	03/21/24 08:23	97,6010D	DMC

Prep Information

Digestion Method: EPA 3050B

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2415255

Report Date: 03/21/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-04,06-07,10-12 Batch: WG1898769-2 WG1898769-3 SRM Lot Number: D123-540								
Arsenic, Total	87		89		82-118	2		30

INORGANICS
&
MISCELLANEOUS

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415255
Report Date: 03/21/24

SAMPLE RESULTS

Lab ID: L2415255-01
Client ID: WE-5-SW-3C (0-0.5)
Sample Location: ANDOVER, MA

Date Collected: 03/20/24 11:40
Date Received: 03/20/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	12.6		%	0.100	NA	1	-	03/20/24 21:04	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415255
Report Date: 03/21/24

SAMPLE RESULTS

Lab ID: L2415255-02
Client ID: WE-5-SW-3D (0-0.5)
Sample Location: ANDOVER, MA

Date Collected: 03/20/24 12:15
Date Received: 03/20/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	14.1		%	0.100	NA	1	-	03/20/24 21:04	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415255
Report Date: 03/21/24

SAMPLE RESULTS

Lab ID: L2415255-03
Client ID: WE-5-SW-5C (0-0.5)
Sample Location: ANDOVER, MA

Date Collected: 03/20/24 13:00
Date Received: 03/20/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	18.4		%	0.100	NA	1	-	03/20/24 21:04	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415255
Report Date: 03/21/24

SAMPLE RESULTS

Lab ID: L2415255-04
Client ID: WE-5-SW-5D (0-0.5)
Sample Location: ANDOVER, MA

Date Collected: 03/20/24 13:15
Date Received: 03/20/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	20.1		%	0.100	NA	1	-	03/20/24 21:04	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415255
Report Date: 03/21/24

SAMPLE RESULTS

Lab ID: L2415255-06
Client ID: WE-5-SW-6C (0-0.5)
Sample Location: ANDOVER, MA

Date Collected: 03/20/24 13:30
Date Received: 03/20/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	14.0		%	0.100	NA	1	-	03/20/24 21:04	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415255
Report Date: 03/21/24

SAMPLE RESULTS

Lab ID: L2415255-07
Client ID: WE-5-SW-6D (0-0.5)
Sample Location: ANDOVER, MA

Date Collected: 03/20/24 13:25
Date Received: 03/20/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	21.1		%	0.100	NA	1	-	03/20/24 21:04	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415255
Report Date: 03/21/24

SAMPLE RESULTS

Lab ID: L2415255-10
Client ID: WE-5-B-3-E (1-1.5)
Sample Location: ANDOVER, MA

Date Collected: 03/20/24 15:20
Date Received: 03/20/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	60.6		%	0.100	NA	1	-	03/20/24 21:04	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415255
Report Date: 03/21/24

SAMPLE RESULTS

Lab ID: L2415255-11
Client ID: WE-5-B-3-W (1-1.5)
Sample Location: ANDOVER, MA

Date Collected: 03/20/24 15:30
Date Received: 03/20/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	32.9		%	0.100	NA	1	-	03/20/24 21:04	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415255
Report Date: 03/21/24

SAMPLE RESULTS

Lab ID: L2415255-12
Client ID: WE-5-BSW-2-R (0-0.5)
Sample Location: ANDOVER, MA

Date Collected: 03/20/24 15:35
Date Received: 03/20/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	31.7		%	0.100	NA	1	-	03/20/24 21:04	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415255
Report Date: 03/21/24

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2415255-01A	Plastic 2oz unpreserved for TS	A	NA		2.7	Y	Absent		TS(7)
L2415255-01B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		2.7	Y	Absent		MCP-AS-6010T-10(180)
L2415255-02A	Plastic 2oz unpreserved for TS	A	NA		2.7	Y	Absent		TS(7)
L2415255-02B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		2.7	Y	Absent		MCP-AS-6010T-10(180)
L2415255-03A	Plastic 2oz unpreserved for TS	A	NA		2.7	Y	Absent		TS(7)
L2415255-03B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		2.7	Y	Absent		MCP-AS-6010T-10(180)
L2415255-04A	Plastic 2oz unpreserved for TS	A	NA		2.7	Y	Absent		TS(7)
L2415255-04B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		2.7	Y	Absent		MCP-AS-6010T-10(180)
L2415255-05A	Plastic 2oz unpreserved for TS	A	NA		2.7	Y	Absent		HOLD-WETCHEM()
L2415255-05B	Glass 60mL/2oz unpreserved	A	NA		2.7	Y	Absent		HOLD-METAL(180)
L2415255-06A	Plastic 2oz unpreserved for TS	A	NA		2.7	Y	Absent		TS(7)
L2415255-06B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		2.7	Y	Absent		MCP-AS-6010T-10(180)
L2415255-07A	Plastic 2oz unpreserved for TS	A	NA		2.7	Y	Absent		TS(7)
L2415255-07B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		2.7	Y	Absent		MCP-AS-6010T-10(180)
L2415255-08A	Plastic 2oz unpreserved for TS	A	NA		2.7	Y	Absent		HOLD-WETCHEM()
L2415255-08B	Glass 60mL/2oz unpreserved	A	NA		2.7	Y	Absent		HOLD-METAL(180)
L2415255-09A	Plastic 2oz unpreserved for TS	A	NA		2.7	Y	Absent		HOLD-WETCHEM()
L2415255-09B	Glass 60mL/2oz unpreserved	A	NA		2.7	Y	Absent		HOLD-METAL(180)
L2415255-10A	Plastic 2oz unpreserved for TS	A	NA		2.7	Y	Absent		TS(7)
L2415255-10B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		2.7	Y	Absent		MCP-AS-6010T-10(180)
L2415255-11A	Plastic 2oz unpreserved for TS	A	NA		2.7	Y	Absent		TS(7)
L2415255-11B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		2.7	Y	Absent		MCP-AS-6010T-10(180)
L2415255-12A	Plastic 2oz unpreserved for TS	A	NA		2.7	Y	Absent		TS(7)

*Values in parentheses indicate holding time in days

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415255
Report Date: 03/21/24

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2415255-12B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		2.7	Y	Absent		MCP-AS-6010T-10(180)

*Values in parentheses indicate holding time in days

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2415255
Project Number:	289302	**Report Date:**	03/21/24

GLOSSARY

Acronyms

DL - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EMPC - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LOD - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

LOQ - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

NR - No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TEF - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.

TEQ - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2415255
Project Number:	289302	**Report Date:**	03/21/24

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2415255
Project Number:	289302	**Report Date:**	03/21/24

Data Qualifiers

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2415255
Project Number:	289302	**Report Date:**	03/21/24

REFERENCES

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010; WSC-CAM-IIIA and IIID, January 2024; and WSC-CAM-IIIB and VA, February 2024.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE ____ OF ____

Date Rec'd in Lab: 03/20/24

ALPHA Job #: L2415255

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: CDM Smith
Address: 75 State Street, Suite 701
Boston, MA 02109
Phone: 617-452-6563
Fax:
Email: JonesNE@cdmsmith.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Ledge Rd Landfill
Project Location: Andover, MA
Project #: 289302
Project Manager: Nathan Jones
ALPHA Quote #:

Turn-Around Time

☐ Standard ☒ RUSH (only confirmed if pre-approved)
Date Due: Time: 1 day

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program: MassDEP Criteria: RCS-1 Soil Standards

MA MCP PRESUMPTIVE CERTAINTY ··· CT REASONABLE CONFIDENCE PROTO

☒ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☒ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

include petersoncr@cdmsmith on all emails

ANALYSIS: Total Arsenic

SAMPLE HANDLING
Filtration ____
☐ Done
☒ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	Total Arsenic	Sample Specific Comments	TOTAL # BOTTLES
15255-01	WE-5-SW-3C (0-0.5)	3/20	11:40	SO	CP	X		
-02	WE-5-SW-3D (0-0.5)		12:15	SO				
-03	WE-5-SW-5C (0-0.5)		13:00					
-04	WE-5-SW-5D (0-0.5)		13:15					
-05	WE-5-SW-6E (0-0.5)		1500				Hold	
-06	WE-5-SW-6C (0-0.5)		13:36					
-07	WE-5-SW-6D (0-0.5)		13:55					
-08	WE-5-SW-6E (0-0.5)		14:15				Hold	
-09	WE-5-SW-6F (0-0.5)		14:23				Hold	
-10	WE-5-B-3-E (1-1.5)	↓	15:20	↓	↓	↓		

Container Type	A
Preservative	A

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP or CT RCP?

Relinquished By:	Date/Time	Received By:	Date/Time
[illegible] CDMSmith	3/20/24 4:15pm	[illegible]	3/20 16:33
[illegible]	3/20 17:55	[illegible]	3/20/24 1725

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 18-Jan-2012)

CHAIN OF CUSTODY

PAGE ____ OF ____

Date Rec'd in Lab: 03/20/24

ALPHA Job #: L2415255

ALPHA ANALYTICAL LABS
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: CDM Smith
Address: 75 State Street, Suite 701
Boston, MA 02109
Phone: 617-452-6563
Fax:
Email: JonesNE@cdmsmith.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Ledge Rd Landfill
Project Location: Andover, MA
Project #: 289302
Project Manager: Nathan Jones
ALPHA Quote #:

Turn-Around Time

☐ Standard ☒ RUSH (only confirmed if pre-approved)
Date Due: Time: 1 day

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program: MassDEP Criteria: RCS-1 Soil Standards

MA MCP PRESUMPTIVE CERTAINTY — CT REASONABLE CONFIDENCE PROTO

☒ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☒ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

include petersoncr@cdmsmith on all emails

ANALYSIS: Total Arsenic

SAMPLE HANDLING
Filtration
☐ Done
☒ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	Total Arsenic	Sample Specific Comments
15255-11	WE-S-B-3-W (1-1.5)	3/20	15:20	SO	CP	X	
-12	WE-S-BSW1-2-R (0-0.5)	3/20	1535	SO	CP	X	

Container Type	A																		
Preservative	A																		

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP or CT RCP?

Relinquished By:	Date/Time	Received By:	Date/Time
[illegible]	3/20/24 4:38	[illegible]	3/20 16:35
[illegible]	3/20 16:35	[illegible]	3/20/24 1735

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 16-Jan-2012)

ANALYTICAL REPORT

Lab Number:	L2415698
Client:	CDM Smith, Inc. 75 State Street Suite 701 Boston, MA 02109
ATTN:	Nathan Jones
Phone:	(617) 452-6563
Project Name:	LEDGE RD LANDFILL
Project Number:	289302
Report Date:	03/25/24

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415698
Report Date: 03/25/24

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2415698-01	WE-6-B-1	SOIL	ANDOVER, MA	03/21/24 11:30	03/22/24
L2415698-02	WE-6-B-2	SOIL	ANDOVER, MA	03/21/24 11:35	03/22/24
L2415698-03	WE-6-B-3	SOIL	ANDOVER, MA	03/21/24 11:40	03/22/24
L2415698-04	WE-6-B-4	SOIL	ANDOVER, MA	03/21/24 11:45	03/22/24
L2415698-05	WE-6-B-5	SOIL	ANDOVER, MA	03/21/24 11:50	03/22/24
L2415698-06	WE-6-B-6	SOIL	ANDOVER, MA	03/21/24 11:55	03/22/24
L2415698-07	WE-6-B-7	SOIL	ANDOVER, MA	03/21/24 12:00	03/22/24
L2415698-08	WE-6-B-8	SOIL	ANDOVER, MA	03/21/24 13:05	03/22/24
L2415698-09	WE-6-B-9	SOIL	ANDOVER, MA	03/21/24 13:10	03/22/24
L2415698-10	WE-6-B-10	SOIL	ANDOVER, MA	03/21/24 13:15	03/22/24
L2415698-11	WE-6-B-11	SOIL	ANDOVER, MA	03/21/24 13:20	03/22/24
L2415698-12	WE-6-B-12	SOIL	ANDOVER, MA	03/21/24 13:25	03/22/24
L2415698-13	WE-6-B-13	SOIL	ANDOVER, MA	03/21/24 13:30	03/22/24
L2415698-14	WE-6-B-14	SOIL	ANDOVER, MA	03/21/24 13:35	03/22/24
L2415698-15	WE-6-B-15	SOIL	ANDOVER, MA	03/21/24 13:40	03/22/24
L2415698-16	WE-6-B-16	SOIL	ANDOVER, MA	03/21/24 13:45	03/22/24
L2415698-17	DUPE 9	SOIL	ANDOVER, MA	03/21/24 00:00	03/22/24

Project Name: LEDGE RD LANDFILL **Lab Number:** L2415698

Project Number: 289302 **Report Date:** 03/25/24

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	NO

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2415698
Project Number:	289302	**Report Date:**	03/25/24

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2415698
Project Number:	289302	**Report Date:**	03/25/24

Case Narrative (continued)

MCP Related Narratives

Total Metals

L2415698-01 through -17: The sample has an elevated detection limit due to the dilution required by the sample matrix.

In reference to question H:

The WG1899876-4/-5 MS/MSD recoveries, performed on L2415698-04, are outside the acceptance criteria for arsenic (824%/606%). Re-analysis of the MS/MSD yielded unacceptable recoveries for arsenic (818%/617%). The LCS/LCSD recoveries are acceptable; therefore, no further action was taken.

In reference to question I:

All samples were analyzed for a subset of MCP analytes per client request.

Non MCP Related Narratives

Solids, Total

The WG1899772-1 Laboratory Duplicate RPD for solids, total (22%), performed on L2415698-04, is outside the acceptance criteria. The elevated RPD has been attributed to the non-homogeneous nature of the native sample.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Cristin Walker

Title: Technical Director/Representative Date: 03/25/24

QC OUTLIER SUMMARY REPORT

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415698
Report Date: 03/25/24

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment
MCP Total Metals - Mansfield Lab								
6010D	Batch QC (L2415698-04)	WG1899876-4	Arsenic, Total	MS	824	75-125	01-17	potential high bias
6010D	Batch QC (L2415698-04)	WG1899876-5	Arsenic, Total	MSD	606	75-125	01-17	potential high bias
General Chemistry - Westborough Lab								
2540G	Batch QC (L2415698-04)	WG1899772-1	Solids, Total	Duplicate	22	20	01-17	non-directional bias

METALS

Project Name: LEDGE RD LANDFILL
Lab Number: L2415698
Project Number: 289302
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-01
Client ID: WE-6-B-1
Sample Location: ANDOVER, MA
Date Collected: 03/21/24 11:30
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 68%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	200		mg/kg	2.89	--	5	03/23/24 09:15	03/25/24 10:36	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2415698
Project Number: 289302
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-02
Client ID: WE-6-B-2
Sample Location: ANDOVER, MA
Date Collected: 03/21/24 11:35
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 74%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	17.6		mg/kg	1.02	--	2	03/23/24 09:15	03/24/24 15:28	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2415698
Project Number: 289302
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-03
Client ID: WE-6-B-3
Sample Location: ANDOVER, MA
Date Collected: 03/21/24 11:40
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 49%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	162		mg/kg	1.54	--	2	03/23/24 09:15	03/24/24 15:34	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2415698
Project Number: 289302
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-04
Client ID: WE-6-B-4
Sample Location: ANDOVER, MA
Date Collected: 03/21/24 11:45
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 51%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	73.3		mg/kg	1.53	--	2	03/23/24 09:15	03/24/24 14:30	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2415698
Project Number: 289302
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-05
Client ID: WE-6-B-5
Sample Location: ANDOVER, MA
Date Collected: 03/21/24 11:50
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 40%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	534		mg/kg	1.91	--	2	03/23/24 09:15	03/24/24 15:39	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2415698
Project Number: 289302
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-06
Client ID: WE-6-B-6
Sample Location: ANDOVER, MA
Date Collected: 03/21/24 11:55
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 69%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	35.2		mg/kg	1.11	--	2	03/23/24 09:15	03/24/24 15:45	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2415698
Project Number: 289302
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-07
Client ID: WE-6-B-7
Sample Location: ANDOVER, MA
Date Collected: 03/21/24 12:00
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 70%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	37.9		mg/kg	1.10	--	2	03/23/24 09:15	03/24/24 15:51	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2415698
Project Number: 289302
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-08
Client ID: WE-6-B-8
Sample Location: ANDOVER, MA
Date Collected: 03/21/24 13:05
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 66%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	103		mg/kg	1.15	--	2	03/23/24 09:15	03/24/24 15:56	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2415698
Project Number: 289302
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-09
Client ID: WE-6-B-9
Sample Location: ANDOVER, MA
Date Collected: 03/21/24 13:10
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 51%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	153		mg/kg	1.50	--	2	03/23/24 09:15	03/24/24 16:02	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2415698
Project Number: 289302
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-10
Client ID: WE-6-B-10
Sample Location: ANDOVER, MA
Date Collected: 03/21/24 13:15
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 64%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	58.2		mg/kg	1.22	--	2	03/23/24 09:15	03/24/24 16:08	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2415698
Project Number: 289302
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-11
Client ID: WE-6-B-11
Sample Location: ANDOVER, MA
Date Collected: 03/21/24 13:20
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 60%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	102		mg/kg	1.29	--	2	03/23/24 09:15	03/24/24 16:14	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2415698
Project Number: 289302
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-12
Client ID: WE-6-B-12
Sample Location: ANDOVER, MA
Date Collected: 03/21/24 13:25
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 49%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	98.6		mg/kg	1.57	--	2	03/23/24 09:15	03/24/24 16:31	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2415698
Project Number: 289302
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-13
Client ID: WE-6-B-13
Sample Location: ANDOVER, MA
Date Collected: 03/21/24 13:30
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 58%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	70.8		mg/kg	1.29	--	2	03/23/24 09:15	03/24/24 16:37	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2415698
Project Number: 289302
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-14
Client ID: WE-6-B-14
Sample Location: ANDOVER, MA
Date Collected: 03/21/24 13:35
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 61%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	306		mg/kg	1.26	--	2	03/23/24 09:15	03/24/24 16:42	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2415698
Project Number: 289302
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-15
Client ID: WE-6-B-15
Sample Location: ANDOVER, MA
Date Collected: 03/21/24 13:40
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 57%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	217		mg/kg	1.35	--	2	03/23/24 09:15	03/24/24 16:48	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2415698
Project Number: 289302
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-16
Client ID: WE-6-B-16
Sample Location: ANDOVER, MA
Date Collected: 03/21/24 13:45
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 78%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	49.6		mg/kg	0.983	--	2	03/23/24 09:15	03/24/24 16:54	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Lab Number: L2415698
Project Number: 289302
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-17
Client ID: DUPE 9
Sample Location: ANDOVER, MA
Date Collected: 03/21/24 00:00
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 48%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	192		mg/kg	1.64	--	2	03/23/24 09:15	03/24/24 17:00	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL **Lab Number:** L2415698

Project Number: 289302 **Report Date:** 03/25/24

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-17 Batch: WG1899876-1										
Arsenic, Total	ND		mg/kg	0.400	--	1	03/23/24 09:15	03/24/24 14:13	97,6010D	DHL

Prep Information

Digestion Method: EPA 3050B

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2415698

Report Date: 03/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-17 Batch: WG1899876-2 WG1899876-3 SRM Lot Number: D123-540								
Arsenic, Total	105		100		82-118	5		30

Matrix Spike Analysis
Batch Quality Control

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415698
Report Date: 03/25/24

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-17 QC Batch ID: WG1899876-4 WG1899876-5 QC Sample: L2415698-04 Client ID: WE-6-B-4												
Arsenic, Total	73.3	18.4	225	**824**	Q	184	**606**	Q	75-125	20		35

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Serial Dilution Analysis
Batch Quality Control

Lab Number: L2415698
Report Date: 03/25/24

Parameter	Native Sample	Serial Dilution	Units	% D	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-17 QC Batch ID: WG1899876-6 QC Sample: L2415698-04 Client ID: WE-6-B-4						
Arsenic, Total	73.3	76.1	mg/kg	4		20

INORGANICS
&
MISCELLANEOUS

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415698
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-01
Client ID: WE-6-B-1
Sample Location: ANDOVER, MA

Date Collected: 03/21/24 11:30
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	67.9		%	0.100	NA	1	-	03/22/24 20:51	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415698
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-02
Client ID: WE-6-B-2
Sample Location: ANDOVER, MA

Date Collected: 03/21/24 11:35
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	73.7		%	0.100	NA	1	-	03/22/24 20:51	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415698
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-03
Client ID: WE-6-B-3
Sample Location: ANDOVER, MA

Date Collected: 03/21/24 11:40
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	48.6		%	0.100	NA	1	-	03/22/24 20:51	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415698
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-04
Client ID: WE-6-B-4
Sample Location: ANDOVER, MA

Date Collected: 03/21/24 11:45
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	50.9		%	0.100	NA	1	-	03/22/24 20:51	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415698
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-05
Client ID: WE-6-B-5
Sample Location: ANDOVER, MA

Date Collected: 03/21/24 11:50
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	39.6		%	0.100	NA	1	-	03/22/24 20:51	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415698
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-06
Client ID: WE-6-B-6
Sample Location: ANDOVER, MA

Date Collected: 03/21/24 11:55
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	69.4		%	0.100	NA	1	-	03/22/24 20:51	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415698
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-07
Client ID: WE-6-B-7
Sample Location: ANDOVER, MA

Date Collected: 03/21/24 12:00
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	69.9		%	0.100	NA	1	-	03/22/24 20:51	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415698
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-08
Client ID: WE-6-B-8
Sample Location: ANDOVER, MA

Date Collected: 03/21/24 13:05
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	65.5		%	0.100	NA	1	-	03/22/24 20:51	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415698
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-09
Client ID: WE-6-B-9
Sample Location: ANDOVER, MA

Date Collected: 03/21/24 13:10
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	50.5		%	0.100	NA	1	-	03/22/24 20:51	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415698
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-10
Client ID: WE-6-B-10
Sample Location: ANDOVER, MA

Date Collected: 03/21/24 13:15
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	63.6		%	0.100	NA	1	-	03/22/24 20:51	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415698
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-11
Client ID: WE-6-B-11
Sample Location: ANDOVER, MA

Date Collected: 03/21/24 13:20
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	60.3		%	0.100	NA	1	-	03/22/24 20:51	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415698
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-12
Client ID: WE-6-B-12
Sample Location: ANDOVER, MA

Date Collected: 03/21/24 13:25
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	49.0		%	0.100	NA	1	-	03/22/24 20:51	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415698
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-13
Client ID: WE-6-B-13
Sample Location: ANDOVER, MA

Date Collected: 03/21/24 13:30
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	58.4		%	0.100	NA	1	-	03/22/24 20:51	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415698
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-14
Client ID: WE-6-B-14
Sample Location: ANDOVER, MA

Date Collected: 03/21/24 13:35
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	61.0		%	0.100	NA	1	-	03/22/24 20:51	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415698
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-15
Client ID: WE-6-B-15
Sample Location: ANDOVER, MA

Date Collected: 03/21/24 13:40
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	57.3		%	0.100	NA	1	-	03/22/24 20:51	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415698
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-16
Client ID: WE-6-B-16
Sample Location: ANDOVER, MA

Date Collected: 03/21/24 13:45
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	78.2		%	0.100	NA	1	-	03/22/24 20:51	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415698
Report Date: 03/25/24

SAMPLE RESULTS

Lab ID: L2415698-17
Client ID: DUPE 9
Sample Location: ANDOVER, MA

Date Collected: 03/21/24 00:00
Date Received: 03/22/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	47.9		%	0.100	NA	1	-	03/22/24 20:51	121,2540G	WJM

Lab Duplicate Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2415698

Report Date: 03/25/24

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-17 QC Batch ID: WG1899772-1 QC Sample: L2415698-04 Client ID: WE-6-B-4						
Solids, Total	50.9	40.9	%	**22**	Q	20

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415698
Report Date: 03/25/24

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2415698-01A	Metals Only-Glass 60mL/2oz unpreserved	A	NA		5.2	Y	Absent		MCP-AS-6010T-10(180)
L2415698-01B	Plastic 2oz unpreserved for TS	A	NA		5.2	Y	Absent		TS(7)
L2415698-02A	Metals Only-Glass 60mL/2oz unpreserved	A	NA		5.2	Y	Absent		MCP-AS-6010T-10(180)
L2415698-02B	Plastic 2oz unpreserved for TS	A	NA		5.2	Y	Absent		TS(7)
L2415698-03A	Metals Only-Glass 60mL/2oz unpreserved	A	NA		5.2	Y	Absent		MCP-AS-6010T-10(180)
L2415698-03B	Plastic 2oz unpreserved for TS	A	NA		5.2	Y	Absent		TS(7)
L2415698-04A	Metals Only-Glass 60mL/2oz unpreserved	A	NA		5.2	Y	Absent		MCP-AS-6010T-10(180)
L2415698-04A1	Metals Only-Glass 60mL/2oz unpreserved	A	NA		5.2	Y	Absent		MCP-AS-6010T-10(180)
L2415698-04A2	Metals Only-Glass 60mL/2oz unpreserved	A	NA		5.2	Y	Absent		MCP-AS-6010T-10(180)
L2415698-04B	Plastic 2oz unpreserved for TS	A	NA		5.2	Y	Absent		TS(7)
L2415698-04B1	Plastic 2oz unpreserved for TS	A	NA		5.2	Y	Absent		TS(7)
L2415698-04B2	Plastic 2oz unpreserved for TS	A	NA		5.2	Y	Absent		TS(7)
L2415698-05A	Metals Only-Glass 60mL/2oz unpreserved	A	NA		5.2	Y	Absent		MCP-AS-6010T-10(180)
L2415698-05B	Plastic 2oz unpreserved for TS	A	NA		5.2	Y	Absent		TS(7)
L2415698-06A	Metals Only-Glass 60mL/2oz unpreserved	A	NA		5.2	Y	Absent		MCP-AS-6010T-10(180)
L2415698-06B	Plastic 2oz unpreserved for TS	A	NA		5.2	Y	Absent		TS(7)
L2415698-07A	Metals Only-Glass 60mL/2oz unpreserved	A	NA		5.2	Y	Absent		MCP-AS-6010T-10(180)
L2415698-07B	Plastic 2oz unpreserved for TS	A	NA		5.2	Y	Absent		TS(7)
L2415698-08A	Metals Only-Glass 60mL/2oz unpreserved	A	NA		5.2	Y	Absent		MCP-AS-6010T-10(180)
L2415698-08B	Plastic 2oz unpreserved for TS	A	NA		5.2	Y	Absent		TS(7)
L2415698-09A	Metals Only-Glass 60mL/2oz unpreserved	A	NA		5.2	Y	Absent		MCP-AS-6010T-10(180)
L2415698-09B	Plastic 2oz unpreserved for TS	A	NA		5.2	Y	Absent		TS(7)
L2415698-10A	Metals Only-Glass 60mL/2oz unpreserved	A	NA		5.2	Y	Absent		MCP-AS-6010T-10(180)

*Values in parentheses indicate holding time in days

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2415698
Report Date: 03/25/24

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2415698-10B	Plastic 2oz unpreserved for TS	A	NA		5.2	Y	Absent		TS(7)
L2415698-11A	Metals Only-Glass 60mL/2oz unpreserved	A	NA		5.2	Y	Absent		MCP-AS-6010T-10(180)
L2415698-11B	Plastic 2oz unpreserved for TS	A	NA		5.2	Y	Absent		TS(7)
L2415698-12A	Metals Only-Glass 60mL/2oz unpreserved	A	NA		5.2	Y	Absent		MCP-AS-6010T-10(180)
L2415698-12B	Plastic 2oz unpreserved for TS	A	NA		5.2	Y	Absent		TS(7)
L2415698-13A	Metals Only-Glass 60mL/2oz unpreserved	A	NA		5.2	Y	Absent		MCP-AS-6010T-10(180)
L2415698-13B	Plastic 2oz unpreserved for TS	A	NA		5.2	Y	Absent		TS(7)
L2415698-14A	Metals Only-Glass 60mL/2oz unpreserved	A	NA		5.2	Y	Absent		MCP-AS-6010T-10(180)
L2415698-14B	Plastic 2oz unpreserved for TS	A	NA		5.2	Y	Absent		TS(7)
L2415698-15A	Metals Only-Glass 60mL/2oz unpreserved	A	NA		5.2	Y	Absent		MCP-AS-6010T-10(180)
L2415698-15B	Plastic 2oz unpreserved for TS	A	NA		5.2	Y	Absent		TS(7)
L2415698-16A	Metals Only-Glass 60mL/2oz unpreserved	A	NA		5.2	Y	Absent		MCP-AS-6010T-10(180)
L2415698-16B	Plastic 2oz unpreserved for TS	A	NA		5.2	Y	Absent		TS(7)
L2415698-17A	Metals Only-Glass 60mL/2oz unpreserved	A	NA		5.2	Y	Absent		MCP-AS-6010T-10(180)
L2415698-17B	Plastic 2oz unpreserved for TS	A	NA		5.2	Y	Absent		TS(7)

*Values in parentheses indicate holding time in days

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2415698
Project Number:	289302	**Report Date:**	03/25/24

GLOSSARY

Acronyms

DL - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EMPC - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LOD - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

LOQ - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

NR - No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TEF - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.

TEQ - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2415698
Project Number:	289302	**Report Date:**	03/25/24

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2415698
Project Number:	289302	**Report Date:**	03/25/24

Data Qualifiers

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2415698
Project Number:	289302	**Report Date:**	03/25/24

REFERENCES

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010; WSC-CAM-IIIA and IIID, January 2024; and WSC-CAM-IIIB and VA, February 2024.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

page 1 of 2

Date Rec'd in Lab: 3-22-24

ALPHA Job #: L2415698

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: CDM Smith
Address: 75 State Street, Suite 701
Boston, MA 02109
Phone: 617-452-6563
Fax:
Email: JonesNE@cdmsmith.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Ledge Rd Landfill
Project Location: Andover, MA
Project #: 289302
Project Manager: Nathan Jones
ALPHA Quote #:

Turn-Around Time

☐ Standard ☒ RUSH (only confirmed if pre-approved)
Date Due: Time: 1 day

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program: MassDEP Criteria: RCS-1 Soil Standards

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

☒ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☒ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

include petersoncr@cdmsmith on all emails

ANALYSIS: Total Arsenic

SAMPLE HANDLING
Filtration
☐ Done
☒ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

Sample Specific Comments

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	Total Arsenic	Sample Specific Comments	TOTAL # BOTTLES
15698-01	WE-6-B-1	3/21/24	1130	SO	KG	X		
-02	WE-6-B-2		1135	SO				
-03	WE-6-B-3		1140					
-04	WE-6-B-4		1145					
-05	WE-6-B-5		1150					
-06	WE-6-B-6		1155					
-07	WE-6-B-7		1200					
-08	WE-6-B-8		1205					
-09	WE-6-B-9		1310					
-10	WE-6-B-10		1315					

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP or CT RCP?

Container Type	
Preservative	

Relinquished By:	Date/Time	Received By:	Date/Time
	3/22/24 16:00		3/22 1110
	3-22-24 1805		3/22 1815

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 15-Jan-2012)

CHAIN OF CUSTODY

PAGE 2 OF 2

Date Rec'd in Lab: 3-22-24

ALPHA Job #: L2415698

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: CDM Smith
Address: 75 State Street, Suite 701
Boston, MA 02109
Phone: 617-452-6563
Fax:
Email: JonesNE@cdmsmith.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Ledge Rd Landfill
Project Location: Andover, MA
Project #: 289302
Project Manager: Nathan Jones
ALPHA Quote #:

Turn-Around Time

☐ Standard ☒ RUSH (only confirmed if pre-approved)
Date Due: Time: 1 day

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program: MassDEP Criteria: RCS-1 Soil Standards

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

☒ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☒ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

include petersoncr@cdmsmith on all emails

ANALYSIS — Total Arsenic

SAMPLE HANDLING
Filtration
☐ Done
☒ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	Total Arsenic	Sample Specific Comments
15698 -11	WE-6-B-11	3/21/24	1320	SO	KG	X	
-12	WE-6-B-12		1325	SO			
-13	WE-6-B-13		1330				
-14	WE-6-B-14		1335				
-15	WE-6-B-15		1340				
-16	WE-6-B-16		1345				
-17	Dupe 9		—				
-04 ~~TB~~	WE-6-B-4-MS		1145				
-04 ~~TB~~	WE-6-B-4-MSD		1145				

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP or CT RCP?

Container Type
Preservative

Relinquished By:	Date/Time	Received By:	Date/Time
	3/21/24 1600		3-22-24 1110
	3-22-24 1615		3/22 1515

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 18-Jan-2010)

ANALYTICAL REPORT

Lab Number:	L2416131
Client:	CDM Smith, Inc. 75 State Street Suite 701 Boston, MA 02109
ATTN:	Nathan Jones
Phone:	(617) 452-6563
Project Name:	LEDGE RD LANDFILL
Project Number:	289302
Report Date:	03/26/24

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2416131
Report Date: 03/26/24

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2416131-01	WE-4-B-1	SOIL	ANDOVER, MA	03/25/24 13:00	03/25/24
L2416131-02	WE-4-B-2	SOIL	ANDOVER, MA	03/25/24 13:05	03/25/24
L2416131-03	WE-4-B-3	SOIL	ANDOVER, MA	03/25/24 13:10	03/25/24
L2416131-04	WE-4-B-4	SOIL	ANDOVER, MA	03/25/24 13:15	03/25/24
L2416131-05	WE-4-B-5	SOIL	ANDOVER, MA	03/25/24 13:20	03/25/24
L2416131-06	WE-4-B-6	SOIL	ANDOVER, MA	03/25/24 13:25	03/25/24

Project Name: LEDGE RD LANDFILL **Lab Number:** L2416131

Project Number: 289302 **Report Date:** 03/26/24

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	NO

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2416131
Project Number:	289302	**Report Date:**	03/26/24

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2416131
Project Number:	289302	**Report Date:**	03/26/24

Case Narrative (continued)

MCP Related Narratives

Sample Receipt

In reference to question H:

A Matrix Spike was not submitted for the analysis of Total Metals.

Total Metals

L2416131-01 through -06: The sample has an elevated detection limit due to the dilution required by the sample matrix.

In reference to question I:

All samples were analyzed for a subset of MCP analytes per client request.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Melissa Sturgis Melissa Sturgis

Title: Technical Director/Representative Date: 03/26/24

QC OUTLIER SUMMARY REPORT

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2416131
Report Date: 03/26/24

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment

There are no QC Outliers associated with this report.

METALS

Project Name: LEDGE RD LANDFILL
Lab Number: L2416131
Project Number: 289302
Report Date: 03/26/24

SAMPLE RESULTS

Lab ID: L2416131-01
Client ID: WE-4-B-1
Sample Location: ANDOVER, MA
Date Collected: 03/25/24 13:00
Date Received: 03/25/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 51%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	79.2		mg/kg	1.54	--	2	03/26/24 00:17	03/26/24 10:33	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL
Lab Number: L2416131
Project Number: 289302
Report Date: 03/26/24

SAMPLE RESULTS

Lab ID: L2416131-02
Client ID: WE-4-B-2
Sample Location: ANDOVER, MA
Date Collected: 03/25/24 13:05
Date Received: 03/25/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 41%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	49.3		mg/kg	1.89	--	2	03/26/24 00:17	03/26/24 10:38	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL
Lab Number: L2416131
Project Number: 289302
Report Date: 03/26/24

SAMPLE RESULTS

Lab ID: L2416131-03
Client ID: WE-4-B-3
Sample Location: ANDOVER, MA
Date Collected: 03/25/24 13:10
Date Received: 03/25/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 53%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	92.2		mg/kg	1.47	--	2	03/26/24 00:17	03/26/24 10:42	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL
Lab Number: L2416131
Project Number: 289302
Report Date: 03/26/24

SAMPLE RESULTS

Lab ID: L2416131-04
Client ID: WE-4-B-4
Sample Location: ANDOVER, MA
Date Collected: 03/25/24 13:15
Date Received: 03/25/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 76%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	11.6		mg/kg	1.03	--	2	03/26/24 00:17	03/26/24 10:46	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL
Lab Number: L2416131
Project Number: 289302
Report Date: 03/26/24

SAMPLE RESULTS

Lab ID: L2416131-05
Client ID: WE-4-B-5
Sample Location: ANDOVER, MA
Date Collected: 03/25/24 13:20
Date Received: 03/25/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 72%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	17.1		mg/kg	1.07	--	2	03/26/24 00:17	03/26/24 10:51	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL
Lab Number: L2416131
Project Number: 289302
Report Date: 03/26/24

SAMPLE RESULTS

Lab ID: L2416131-06
Client ID: WE-4-B-6
Sample Location: ANDOVER, MA
Date Collected: 03/25/24 13:25
Date Received: 03/25/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 73%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	24.0		mg/kg	1.05	--	2	03/26/24 00:17	03/26/24 10:55	EPA 3050B	97,6010D	DMC

Project Name: LEDGE RD LANDFILL **Lab Number:** L2416131

Project Number: 289302 **Report Date:** 03/26/24

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-06 Batch: WG1900667-1										
Arsenic, Total	ND		mg/kg	0.400	--	1	03/26/24 00:17	03/26/24 10:20	97,6010D	DMC

Prep Information

Digestion Method: EPA 3050B

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2416131

Report Date: 03/26/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-06 Batch: WG1900667-2 WG1900667-3 SRM Lot Number: D123-540								
Arsenic, Total	91		101		82-118	10		30

INORGANICS
&
MISCELLANEOUS

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2416131
Report Date: 03/26/24

SAMPLE RESULTS

Lab ID: L2416131-01
Client ID: WE-4-B-1
Sample Location: ANDOVER, MA

Date Collected: 03/25/24 13:00
Date Received: 03/25/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	51.1		%	0.100	NA	1	-	03/25/24 22:07	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2416131
Report Date: 03/26/24

SAMPLE RESULTS

Lab ID: L2416131-02
Client ID: WE-4-B-2
Sample Location: ANDOVER, MA

Date Collected: 03/25/24 13:05
Date Received: 03/25/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	41.1		%	0.100	NA	1	-	03/25/24 22:07	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2416131
Report Date: 03/26/24

SAMPLE RESULTS

Lab ID: L2416131-03
Client ID: WE-4-B-3
Sample Location: ANDOVER, MA

Date Collected: 03/25/24 13:10
Date Received: 03/25/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	52.9		%	0.100	NA	1	-	03/25/24 22:07	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2416131
Report Date: 03/26/24

SAMPLE RESULTS

Lab ID: L2416131-04
Client ID: WE-4-B-4
Sample Location: ANDOVER, MA

Date Collected: 03/25/24 13:15
Date Received: 03/25/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	76.2		%	0.100	NA	1	-	03/25/24 22:07	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2416131
Report Date: 03/26/24

SAMPLE RESULTS

Lab ID: L2416131-05
Client ID: WE-4-B-5
Sample Location: ANDOVER, MA

Date Collected: 03/25/24 13:20
Date Received: 03/25/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	71.7		%	0.100	NA	1	-	03/25/24 22:07	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2416131
Report Date: 03/26/24

SAMPLE RESULTS

Lab ID: L2416131-06
Client ID: WE-4-B-6
Sample Location: ANDOVER, MA

Date Collected: 03/25/24 13:25
Date Received: 03/25/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	73.4		%	0.100	NA	1	-	03/25/24 22:07	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2416131
Report Date: 03/26/24

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2416131-01A	Plastic 2oz unpreserved for TS	A	NA		2.5	Y	Absent		TS(7)
L2416131-01B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		2.5	Y	Absent		MCP-AS-6010T-10(180)
L2416131-02A	Plastic 2oz unpreserved for TS	A	NA		2.5	Y	Absent		TS(7)
L2416131-02B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		2.5	Y	Absent		MCP-AS-6010T-10(180)
L2416131-03A	Plastic 2oz unpreserved for TS	A	NA		2.5	Y	Absent		TS(7)
L2416131-03B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		2.5	Y	Absent		MCP-AS-6010T-10(180)
L2416131-04A	Plastic 2oz unpreserved for TS	A	NA		2.5	Y	Absent		TS(7)
L2416131-04B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		2.5	Y	Absent		MCP-AS-6010T-10(180)
L2416131-05A	Plastic 2oz unpreserved for TS	A	NA		2.5	Y	Absent		TS(7)
L2416131-05B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		2.5	Y	Absent		MCP-AS-6010T-10(180)
L2416131-06A	Plastic 2oz unpreserved for TS	A	NA		2.5	Y	Absent		TS(7)
L2416131-06B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		2.5	Y	Absent		MCP-AS-6010T-10(180)

*Values in parentheses indicate holding time in days

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2416131
Project Number:	289302	**Report Date:**	03/26/24

GLOSSARY

Acronyms

DL - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EMPC - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LOD - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

LOQ - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

NR - No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TEF - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.

TEQ - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2416131
Project Number:	289302	**Report Date:**	03/26/24

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2416131
Project Number:	289302	**Report Date:**	03/26/24

Data Qualifiers

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2416131
Project Number:	289302	**Report Date:**	03/26/24

REFERENCES

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010; WSC-CAM-IIIA and IIID, January 2024; and WSC-CAM-IIIB and VA, February 2024.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 03/25/24

ALPHA Job #: L2416131

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: CDM Smith
Address: 75 State Street, Suite 701
Boston, MA 02109
Phone: 617-452-6563
Fax:
Email: JonesNE@cdmsmith.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Ledge Rd Landfill
Project Location: Andover, MA
Project #: 289302
Project Manager: Nathan Jones
ALPHA Quote #:

Turn-Around Time

☐ Standard ☒ RUSH (only confirmed if pre-approved)
Date Due: Time: 1 day

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program: MassDEP Criteria: RCS-1 Soil Standards

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

☒ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☒ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

include petersoncr@cdmsmith on all emails

ANALYSIS: Total Arsenic

SAMPLE HANDLING
Filtration
☐ Done
☒ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

Sample Specific Comments

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	Total Arsenic	Sample Specific Comments	TOTAL # BOTTLES
16131-01	WE-4-B-1	3/25/24	13:00	SO	HG	X		
-02	WE-4-B-2		13:05	SO				
-03	WE-4-B-3		13:10					
-04	WE-4-B-4		13:15					
-05	WE-4-B-5		13:20					
-06	WE-4-B-6		13:25					

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP or CT RCP?

	Container Type											
	Preservative											

Relinquished By:	Date/Time	Received By:	Date/Time
	3/25/24 16:10		3/25/24 1600
	3/25/24 1845		3/25/24 1845

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 18-Jan-2010)

ANALYTICAL REPORT

Lab Number:	L2416554
Client:	CDM Smith, Inc. 75 State Street Suite 701 Boston, MA 02109
ATTN:	Nathan Jones
Phone:	(617) 452-6563
Project Name:	LEDGE RD LANDFILL
Project Number:	289302
Report Date:	03/28/24

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2416554
Report Date: 03/28/24

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2416554-01	WE-5-BSW-REDO	SOIL	ANDOVER, MA	03/26/24 15:00	03/27/24

Project Name: LEDGE RD LANDFILL **Lab Number:** L2416554

Project Number: 289302 **Report Date:** 03/28/24

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	NO

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2416554
Project Number:	289302	**Report Date:**	03/28/24

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2416554
Project Number:	289302	**Report Date:**	03/28/24

Case Narrative (continued)

MCP Related Narratives

Sample Receipt

In reference to question H:

A Matrix Spike was not submitted for the analysis of Total Metals.

Total Metals

L2416554-01: The sample has an elevated detection limit due to the dilution required by the sample matrix.

In reference to question I:

All samples were analyzed for a subset of MCP analytes per client request.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Kelly O'Neill

Title: Technical Director/Representative Date: 03/28/24

QC OUTLIER SUMMARY REPORT

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2416554
Report Date: 03/28/24

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment

There are no QC Outliers associated with this report.

METALS

Project Name: LEDGE RD LANDFILL
Lab Number: L2416554
Project Number: 289302
Report Date: 03/28/24

SAMPLE RESULTS

Lab ID: L2416554-01
Client ID: WE-5-BSW-REDO
Sample Location: ANDOVER, MA
Date Collected: 03/26/24 15:00
Date Received: 03/27/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 60%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	205		mg/kg	1.31	--	2	03/28/24 07:55	03/28/24 13:14	EPA 3050B	97,6010D	JMF

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2416554
Report Date: 03/28/24

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1901780-1										
Arsenic, Total	ND		mg/kg	0.400	--	1	03/28/24 07:55	03/28/24 12:44	97,6010D	JMF

Prep Information

Digestion Method: EPA 3050B

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2416554

Report Date: 03/28/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1901780-2 WG1901780-3 SRM Lot Number: D123-540								
Arsenic, Total	96		91		82-118	5		30

INORGANICS
&
MISCELLANEOUS

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2416554
Report Date: 03/28/24

SAMPLE RESULTS

Lab ID: L2416554-01
Client ID: WE-5-BSW-REDO
Sample Location: ANDOVER, MA

Date Collected: 03/26/24 15:00
Date Received: 03/27/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	59.7		%	0.100	NA	1	-	03/27/24 22:40	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2416554
Report Date: 03/28/24

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2416554-01A	Plastic 2oz unpreserved for TS	A	NA		4.3	Y	Absent		TS(7)
L2416554-01B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.3	Y	Absent		MCP-AS-6010T-10(180)

*Values in parentheses indicate holding time in days

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2416554
Project Number:	289302	**Report Date:**	03/28/24

GLOSSARY

Acronyms

DL - Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

EDL - Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

EMPC - Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LOD - Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

LOQ - Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NDPA/DPA - N-Nitrosodiphenylamine/Diphenylamine.

NI - Not Ignitable.

NP - Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.

NR - No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

STLP - Semi-dynamic Tank Leaching Procedure per EPA Method 1315.

TEF - Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.

TEQ - Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.

TIC - Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2416554
Project Number:	289302	**Report Date:**	03/28/24

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2416554
Project Number:	289302	**Report Date:**	03/28/24

Data Qualifiers

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: Data Usability Report

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2416554
Project Number:	289302	**Report Date:**	03/28/24

REFERENCES

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010; WSC-CAM-IIIA and IIID, January 2024; and WSC-CAM-IIIB and VA, February 2024.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 3/27/24

ALPHA Job #: L2416554

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: CDM Smith
Address: 75 State Street, Suite 701
Boston, MA 02109
Phone: 617-452-6563
Fax:
Email: JonesNE@cdmsmith.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Ledge Rd Landfill
Project Location: Andover, MA
Project #: 289302
Project Manager: Nathan Jones
ALPHA Quote #:

Turn-Around Time

☐ Standard ☒ RUSH (only confirmed if pre-approved)
Date Due: Time: 1 day

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program: MassDEP Criteria: RCS-1 Soil Standards

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

☒ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☒ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

include petersoncr@cdmsmith on all emails

ANALYSIS: Total Arsenic

SAMPLE HANDLING
Filtration
☐ Done
☒ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	Total Arsenic	Sample Specific Comments
16554-01	WE-5-BSW-REDD	3/26/24	1500	SO	KG	X	
				SO			

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP or CT RCP?

	Container Type																			
	Preservative																			

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	3/27/24 10:45	[signature] MC	3/27 10:45
[signature] MC	3/27 17:48	[signature]	3/27 17:48

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

(FORM NO. 01-01 (rev. 16-Jan-2013))

ANALYTICAL REPORT

Lab Number:	L2417561
Client:	CDM Smith, Inc. 75 State Street Suite 701 Boston, MA 02109
ATTN:	Nathan Jones
Phone:	(617) 452-6563
Project Name:	LEDGE RD LANDFILL
Project Number:	289302
Report Date:	04/02/24

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Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

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508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2417561
Report Date: 04/02/24

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2417561-01	WE-3-SW-5A	SOIL	ANDOVER, MA	04/01/24 10:20	04/01/24

Project Name: LEDGE RD LANDFILL **Lab Number:** L2417561

Project Number: 289302 **Report Date:** 04/02/24

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	NO

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2417561
Project Number:	289302	**Report Date:**	04/02/24

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name:	LEDGE RD LANDFILL	**Lab Number:**	L2417561
Project Number:	289302	**Report Date:**	04/02/24

Case Narrative (continued)

MCP Related Narratives

Sample Receipt

In reference to question H:

A Matrix Spike was not submitted for the analysis of Total Metals.

Total Metals

L2417561-01: The sample has an elevated detection limit due to the dilution required by the sample matrix.

In reference to question I:

All samples were analyzed for a subset of MCP analytes per client request.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Kelly O'Neill

Title: Technical Director/Representative Date: 04/02/24

QC OUTLIER SUMMARY REPORT

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2417561
Report Date: 04/02/24

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment

There are no QC Outliers associated with this report.

METALS

Project Name: LEDGE RD LANDFILL
Lab Number: L2417561
Project Number: 289302
Report Date: 04/02/24

SAMPLE RESULTS

Lab ID: L2417561-01
Client ID: WE-3-SW-5A
Sample Location: ANDOVER, MA
Date Collected: 04/01/24 10:20
Date Received: 04/01/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 28%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	372		mg/kg	6.88	--	5	04/02/24 06:50	04/02/24 13:19	EPA 3050B	97,6010D	DHL

Project Name: LEDGE RD LANDFILL
Project Number: 289302
Lab Number: L2417561
Report Date: 04/02/24

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1903621-1										
Arsenic, Total	ND		mg/kg	0.400	--	1	04/02/24 06:50	04/02/24 11:33	97,6010D	DHL

Prep Information

Digestion Method: EPA 3050B

Lab Control Sample Analysis

Batch Quality Control

Project Name: LEDGE RD LANDFILL

Project Number: 289302

Lab Number: L2417561

Report Date: 04/02/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1903621-2 WG1903621-3 SRM Lot Number: D123-540								
Arsenic, Total	97		100		82-118	3		30

INORGANICS
&
MISCELLANEOUS

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2417561
Report Date: 04/02/24

SAMPLE RESULTS

Lab ID: L2417561-01
Client ID: WE-3-SW-5A
Sample Location: ANDOVER, MA

Date Collected: 04/01/24 10:20
Date Received: 04/01/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	28.1		%	0.100	NA	1	-	04/01/24 22:48	121,2540G	WJM

Project Name: LEDGE RD LANDFILL
Project Number: 289302

Lab Number: L2417561
Report Date: 04/02/24

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2417561-01A	Plastic 2oz unpreserved for TS	A	NA		5.8	Y	Absent		TS(7)
L2417561-01B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		5.8	Y	Absent		MCP-AS-6010T-10(180)

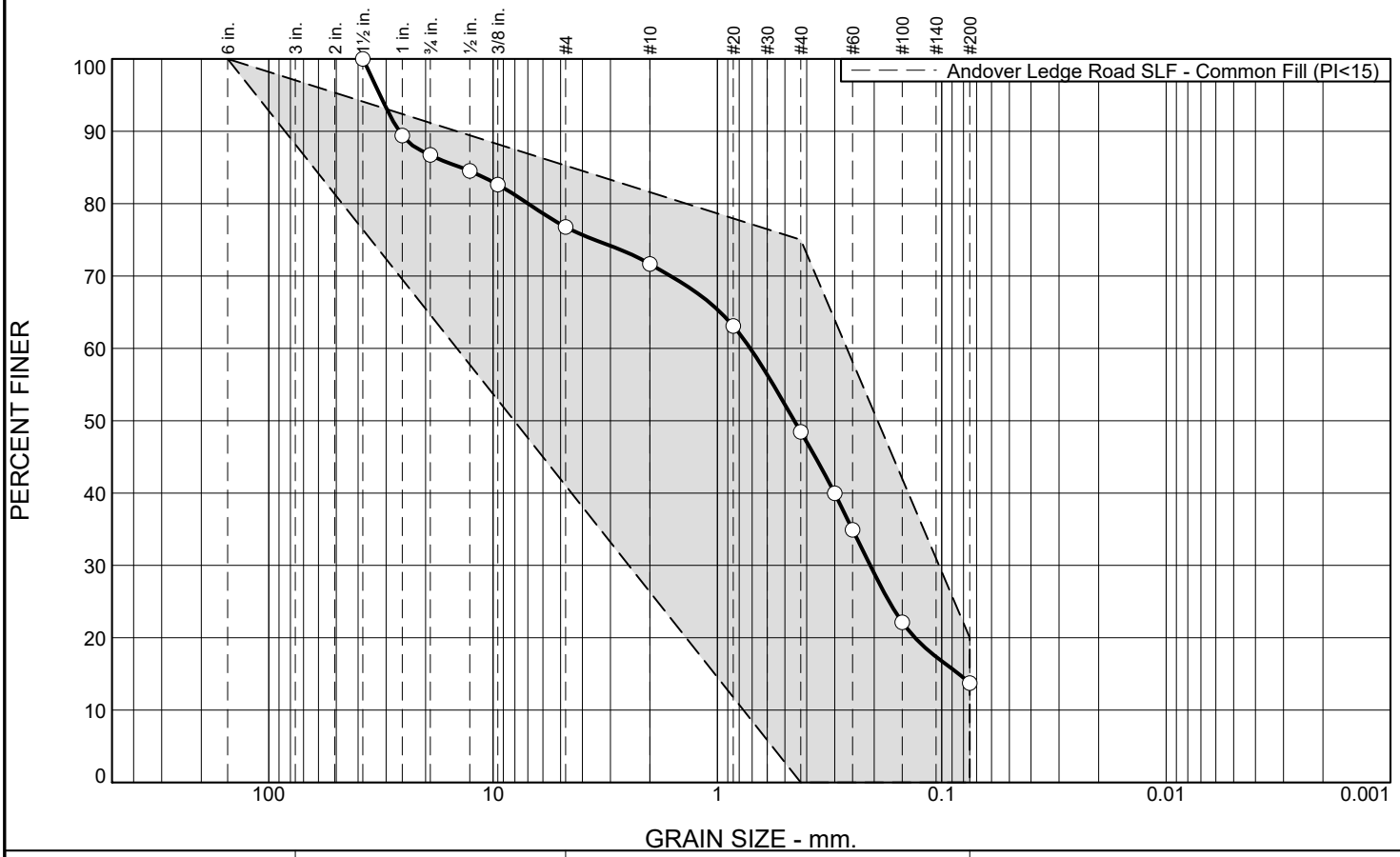
*Values in parentheses indicate holding time in days

CDM
Smith
cdmsmith.com

Appendix F Imported Material Test Results

Appendix F-1 Common Fill Test Results

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	13.3	9.9	5.1	23.2	34.8	13.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	89.4		
.75	86.7		
.5	84.5		
3/8	82.6		
#4	76.8		
#10	71.7		
#20	63.1		
#40	48.5	0-75	
#50	40.0		
#60	34.9		
#100	22.1		
#200	13.7	0-20	

* Andover Ledge Road SLF - Common Fill (PI<15)

Material Description

Brown 1.5" max silty sand some gravel
Not enough material for proctor test

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 13.8689 D_{60}= 0.7139 D_{50}= 0.4545
D_{30}= 0.2084 D_{15}= 0.0840 D_{10}=
C_u= C_c=

Classification

USCS= SM AASHTO= A-1-b

Remarks

Sample submitted by client on 11/14/23
Met project "Common Fill" gradation limits

Sample No.: L-33761 **Source of Sample:** Ledge Rd - Andover MA **Date:** 11/17/23
Location: J.W.White - Common Fill **Elev./Depth:** submitted

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

ANALYTICAL REPORT

Lab Number:	L2369003
Client:	J. Bates & Son, LLC P.O Box 997 Clinton, MA 01510
ATTN:	Seth Mcnally
Phone:	(978) 368-7001
Project Name:	ANDOVER LF
Project Number:	Not Specified
Report Date:	11/30/23

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508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2369003
Report Date: 11/30/23

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2369003-01	JW WHITE FILL	SOIL	ANDOVER, MA	11/20/23 09:30	11/20/23

Project Name:	ANDOVER LF	**Lab Number:**	L2369003
Project Number:	Not Specified	**Report Date:**	11/30/23

MADEP MCP Response Action Analytical Report Certification

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C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	YES

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	ANDOVER LF	**Lab Number:**	L2369003
Project Number:	Not Specified	**Report Date:**	11/30/23

Case Narrative

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Please contact Project Management at 800-624-9220 with any questions.

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2369003
Report Date: 11/30/23

Case Narrative (continued)

MCP Related Narratives

Sample Receipt

In reference to question H:

A Matrix Spike was not submitted for the analysis of Total Metals.

Volatile Organics

L2369003-01: Initial calibration utilized a quadratic fit for: chlorodibromomethane, styrene

In reference to question H:

L2369003-01: Initial Calibration did not meet:

Lowest Calibration Standard Minimum Response Factor: 1,1-dichloroethane (0.2894), cis-1,2-dichloroethene (0.1869), bromochloromethane (0.0759), trichloroethene (0.1707), 1,2-dichloropropane (0.1408), bromodichloromethane (0.2507), cis-1,3-dichloropropene (0.2188), trans-1,3-dichloropropene (0.2802), 1,1,2-trichloroethane (0.1114)

Average Response Factor: bromochloromethane, 1,2-dichloropropane, bromodichloromethane, cis-1,3-dichloropropene, trans-1,3-dichloropropene, 1,1,2-trichloroethane

L2369003-01: The associated continuing calibration standard is outside the acceptance criteria for several compounds; however, it is within overall method allowances. Associated results are considered to be biased high if the %D is negative and biased low if the %D is positive. A copy of the continuing calibration standard is included as an addendum to this report.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Michelle M. Morris

Title: Technical Director/Representative Date: 11/30/23

QC OUTLIER SUMMARY REPORT

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2369003
Report Date: 11/30/23

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment

There are no QC Outliers associated with this report.

ORGANICS

VOLATILES

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2369003
Report Date: 11/30/23

SAMPLE RESULTS

Lab ID: L2369003-01
Client ID: JW WHITE FILL
Sample Location: ANDOVER, MA
Date Collected: 11/20/23 09:30
Date Received: 11/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8260D
Analytical Date: 11/28/23 11:36
Analyst: AJK
Percent Solids: 95%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Methylene chloride	ND		ug/kg	3.5	--	1
1,1-Dichloroethane	ND		ug/kg	0.70	--	1
Chloroform	ND		ug/kg	1.0	--	1
Carbon tetrachloride	ND		ug/kg	0.70	--	1
1,2-Dichloropropane	ND		ug/kg	0.70	--	1
Dibromochloromethane	ND		ug/kg	0.70	--	1
1,1,2-Trichloroethane	ND		ug/kg	0.70	--	1
Tetrachloroethene	ND		ug/kg	0.35	--	1
Chlorobenzene	ND		ug/kg	0.35	--	1
Trichlorofluoromethane	ND		ug/kg	2.8	--	1
1,2-Dichloroethane	ND		ug/kg	0.70	--	1
1,1,1-Trichloroethane	ND		ug/kg	0.35	--	1
Bromodichloromethane	ND		ug/kg	0.35	--	1
trans-1,3-Dichloropropene	ND		ug/kg	0.70	--	1
cis-1,3-Dichloropropene	ND		ug/kg	0.35	--	1
1,3-Dichloropropene, Total	ND		ug/kg	0.35	--	1
1,1-Dichloropropene	ND		ug/kg	0.35	--	1
Bromoform	ND		ug/kg	2.8	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.35	--	1
Benzene	ND		ug/kg	0.35	--	1
Toluene	ND		ug/kg	0.70	--	1
Ethylbenzene	ND		ug/kg	0.70	--	1
Chloromethane	ND		ug/kg	2.8	--	1
Bromomethane	ND		ug/kg	1.4	--	1
Vinyl chloride	ND		ug/kg	0.70	--	1
Chloroethane	ND		ug/kg	1.4	--	1
1,1-Dichloroethene	ND		ug/kg	0.70	--	1
trans-1,2-Dichloroethene	ND		ug/kg	1.0	--	1

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2369003
Report Date: 11/30/23

SAMPLE RESULTS

Lab ID: L2369003-01
Client ID: JW WHITE FILL
Sample Location: ANDOVER, MA
Date Collected: 11/20/23 09:30
Date Received: 11/20/23
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Trichloroethene	ND		ug/kg	0.35	--	1
1,2-Dichlorobenzene	ND		ug/kg	1.4	--	1
1,3-Dichlorobenzene	ND		ug/kg	1.4	--	1
1,4-Dichlorobenzene	ND		ug/kg	1.4	--	1
Methyl tert butyl ether	ND		ug/kg	1.4	--	1
p/m-Xylene	ND		ug/kg	1.4	--	1
o-Xylene	ND		ug/kg	0.70	--	1
Xylenes, Total	ND		ug/kg	0.70	--	1
cis-1,2-Dichloroethene	ND		ug/kg	0.70	--	1
1,2-Dichloroethene, Total	ND		ug/kg	0.70	--	1
Dibromomethane	ND		ug/kg	1.4	--	1
1,2,3-Trichloropropane	ND		ug/kg	1.4	--	1
Styrene	ND		ug/kg	0.70	--	1
Dichlorodifluoromethane	ND		ug/kg	7.0	--	1
Acetone	ND		ug/kg	17	--	1
Carbon disulfide	ND		ug/kg	7.0	--	1
Methyl ethyl ketone	ND		ug/kg	7.0	--	1
Methyl isobutyl ketone	ND		ug/kg	7.0	--	1
2-Hexanone	ND		ug/kg	7.0	--	1
Bromochloromethane	ND		ug/kg	1.4	--	1
Tetrahydrofuran	ND		ug/kg	2.8	--	1
2,2-Dichloropropane	ND		ug/kg	1.4	--	1
1,2-Dibromoethane	ND		ug/kg	0.70	--	1
1,3-Dichloropropane	ND		ug/kg	1.4	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	0.35	--	1
Bromobenzene	ND		ug/kg	1.4	--	1
n-Butylbenzene	ND		ug/kg	0.70	--	1
sec-Butylbenzene	ND		ug/kg	0.70	--	1
tert-Butylbenzene	ND		ug/kg	1.4	--	1
o-Chlorotoluene	ND		ug/kg	1.4	--	1
p-Chlorotoluene	ND		ug/kg	1.4	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	2.1	--	1
Hexachlorobutadiene	ND		ug/kg	2.8	--	1
Isopropylbenzene	ND		ug/kg	0.70	--	1
p-Isopropyltoluene	ND		ug/kg	0.70	--	1
Naphthalene	ND		ug/kg	2.8	--	1
n-Propylbenzene	ND		ug/kg	0.70	--	1

Project Name: ANDOVER LF
Lab Number: L2369003
Project Number: Not Specified
Report Date: 11/30/23

SAMPLE RESULTS

Lab ID: L2369003-01
Client ID: JW WHITE FILL
Sample Location: ANDOVER, MA
Date Collected: 11/20/23 09:30
Date Received: 11/20/23
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	1.4	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	1.4	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	1.4	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	1.4	--	1
Diethyl ether	ND		ug/kg	1.4	--	1
Diisopropyl Ether	ND		ug/kg	1.4	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	1.4	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	1.4	--	1
1,4-Dioxane	ND		ug/kg	56	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	115		70-130
Toluene-d8	96		70-130
4-Bromofluorobenzene	100		70-130
Dibromofluoromethane	108		70-130

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2369003
Report Date: 11/30/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 11/28/23 09:04
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1857208-5					
Methylene chloride	ND		ug/kg	5.0	--
1,1-Dichloroethane	ND		ug/kg	1.0	--
Chloroform	ND		ug/kg	1.5	--
Carbon tetrachloride	ND		ug/kg	1.0	--
1,2-Dichloropropane	ND		ug/kg	1.0	--
Dibromochloromethane	ND		ug/kg	1.0	--
1,1,2-Trichloroethane	ND		ug/kg	1.0	--
Tetrachloroethene	ND		ug/kg	0.50	--
Chlorobenzene	ND		ug/kg	0.50	--
Trichlorofluoromethane	ND		ug/kg	4.0	--
1,2-Dichloroethane	ND		ug/kg	1.0	--
1,1,1-Trichloroethane	ND		ug/kg	0.50	--
Bromodichloromethane	ND		ug/kg	0.50	--
trans-1,3-Dichloropropene	ND		ug/kg	1.0	--
cis-1,3-Dichloropropene	ND		ug/kg	0.50	--
1,3-Dichloropropene, Total	ND		ug/kg	0.50	--
1,1-Dichloropropene	ND		ug/kg	0.50	--
Bromoform	ND		ug/kg	4.0	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.50	--
Benzene	ND		ug/kg	0.50	--
Toluene	ND		ug/kg	1.0	--
Ethylbenzene	ND		ug/kg	1.0	--
Chloromethane	ND		ug/kg	4.0	--
Bromomethane	ND		ug/kg	2.0	--
Vinyl chloride	ND		ug/kg	1.0	--
Chloroethane	ND		ug/kg	2.0	--
1,1-Dichloroethene	ND		ug/kg	1.0	--
trans-1,2-Dichloroethene	ND		ug/kg	1.5	--
Trichloroethene	ND		ug/kg	0.50	--

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2369003
Report Date: 11/30/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 11/28/23 09:04
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1857208-5					
1,2-Dichlorobenzene	ND		ug/kg	2.0	--
1,3-Dichlorobenzene	ND		ug/kg	2.0	--
1,4-Dichlorobenzene	ND		ug/kg	2.0	--
Methyl tert butyl ether	ND		ug/kg	2.0	--
p/m-Xylene	ND		ug/kg	2.0	--
o-Xylene	ND		ug/kg	1.0	--
Xylenes, Total	ND		ug/kg	1.0	--
cis-1,2-Dichloroethene	ND		ug/kg	1.0	--
1,2-Dichloroethene, Total	ND		ug/kg	1.0	--
Dibromomethane	ND		ug/kg	2.0	--
1,2,3-Trichloropropane	ND		ug/kg	2.0	--
Styrene	ND		ug/kg	1.0	--
Dichlorodifluoromethane	ND		ug/kg	10	--
Acetone	ND		ug/kg	25	--
Carbon disulfide	ND		ug/kg	10	--
Methyl ethyl ketone	ND		ug/kg	10	--
Methyl isobutyl ketone	ND		ug/kg	10	--
2-Hexanone	ND		ug/kg	10	--
Bromochloromethane	ND		ug/kg	2.0	--
Tetrahydrofuran	ND		ug/kg	4.0	--
2,2-Dichloropropane	ND		ug/kg	2.0	--
1,2-Dibromoethane	ND		ug/kg	1.0	--
1,3-Dichloropropane	ND		ug/kg	2.0	--
1,1,1,2-Tetrachloroethane	ND		ug/kg	0.50	--
Bromobenzene	ND		ug/kg	2.0	--
n-Butylbenzene	ND		ug/kg	1.0	--
sec-Butylbenzene	ND		ug/kg	1.0	--
tert-Butylbenzene	ND		ug/kg	2.0	--
o-Chlorotoluene	ND		ug/kg	2.0	--

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2369003
Report Date: 11/30/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 11/28/23 09:04
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1857208-5					
p-Chlorotoluene	ND		ug/kg	2.0	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	3.0	--
Hexachlorobutadiene	ND		ug/kg	4.0	--
Isopropylbenzene	ND		ug/kg	1.0	--
p-Isopropyltoluene	ND		ug/kg	1.0	--
Naphthalene	ND		ug/kg	4.0	--
n-Propylbenzene	ND		ug/kg	1.0	--
1,2,3-Trichlorobenzene	ND		ug/kg	2.0	--
1,2,4-Trichlorobenzene	ND		ug/kg	2.0	--
1,3,5-Trimethylbenzene	ND		ug/kg	2.0	--
1,2,4-Trimethylbenzene	ND		ug/kg	2.0	--
Diethyl ether	ND		ug/kg	2.0	--
Diisopropyl Ether	ND		ug/kg	2.0	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	2.0	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	2.0	--
1,4-Dioxane	ND		ug/kg	80	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	99		70-130
Toluene-d8	98		70-130
4-Bromofluorobenzene	100		70-130
Dibromofluoromethane	99		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2369003
Report Date: 11/30/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1857208-3 WG1857208-4								
Methylene chloride	94		91		70-130	3		20
1,1-Dichloroethane	105		98		70-130	7		20
Chloroform	103		97		70-130	6		20
Carbon tetrachloride	109		99		70-130	10		20
1,2-Dichloropropane	105		100		70-130	5		20
Dibromochloromethane	95		94		70-130	1		20
1,1,2-Trichloroethane	102		100		70-130	2		20
Tetrachloroethene	108		101		70-130	7		20
Chlorobenzene	97		94		70-130	3		20
Trichlorofluoromethane	112		100		70-130	11		20
1,2-Dichloroethane	103		99		70-130	4		20
1,1,1-Trichloroethane	109		98		70-130	11		20
Bromodichloromethane	104		100		70-130	4		20
trans-1,3-Dichloropropene	104		104		70-130	0		20
cis-1,3-Dichloropropene	107		104		70-130	3		20
1,1-Dichloropropene	114		102		70-130	11		20
Bromoform	82		81		70-130	1		20
1,1,2,2-Tetrachloroethane	102		101		70-130	1		20
Benzene	104		97		70-130	7		20
Toluene	100		95		70-130	5		20
Ethylbenzene	103		98		70-130	5		20
Chloromethane	110		100		70-130	10		20
Bromomethane	93		86		70-130	8		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2369003
Report Date: 11/30/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1857208-3 WG1857208-4								
Vinyl chloride	112		100		70-130	11		20
Chloroethane	108		96		70-130	12		20
1,1-Dichloroethene	107		98		70-130	9		20
trans-1,2-Dichloroethene	103		95		70-130	8		20
Trichloroethene	108		100		70-130	8		20
1,2-Dichlorobenzene	95		93		70-130	2		20
1,3-Dichlorobenzene	99		95		70-130	4		20
1,4-Dichlorobenzene	97		93		70-130	4		20
Methyl tert butyl ether	106		104		70-130	2		20
p/m-Xylene	105		100		70-130	5		20
o-Xylene	100		97		70-130	3		20
cis-1,2-Dichloroethene	99		95		70-130	4		20
Dibromomethane	99		98		70-130	1		20
1,2,3-Trichloropropane	101		97		70-130	4		20
Styrene	95		93		70-130	2		20
Dichlorodifluoromethane	114		100		70-130	13		20
Acetone	110		106		70-130	4		20
Carbon disulfide	104		94		70-130	10		20
Methyl ethyl ketone	116		112		70-130	4		20
Methyl isobutyl ketone	95		93		70-130	2		20
2-Hexanone	94		92		70-130	2		20
Bromochloromethane	103		100		70-130	3		20
Tetrahydrofuran	117		115		70-130	2		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2369003
Report Date: 11/30/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1857208-3 WG1857208-4								
2,2-Dichloropropane	109		99		70-130	10		20
1,2-Dibromoethane	90		91		70-130	1		20
1,3-Dichloropropane	101		102		70-130	1		20
1,1,1,2-Tetrachloroethane	101		99		70-130	2		20
Bromobenzene	95		92		70-130	3		20
n-Butylbenzene	100		92		70-130	8		20
sec-Butylbenzene	98		89		70-130	10		20
tert-Butylbenzene	105		97		70-130	8		20
o-Chlorotoluene	100		94		70-130	6		20
p-Chlorotoluene	103		96		70-130	7		20
1,2-Dibromo-3-chloropropane	88		88		70-130	0		20
Hexachlorobutadiene	105		97		70-130	8		20
Isopropylbenzene	105		97		70-130	8		20
p-Isopropyltoluene	95		88		70-130	8		20
Naphthalene	100		99		70-130	1		20
n-Propylbenzene	108		99		70-130	9		20
1,2,3-Trichlorobenzene	101		99		70-130	2		20
1,2,4-Trichlorobenzene	102		100		70-130	2		20
1,3,5-Trimethylbenzene	104		97		70-130	7		20
1,2,4-Trimethylbenzene	103		97		70-130	6		20
Diethyl ether	107		106		70-130	1		20
Diisopropyl Ether	107		102		70-130	5		20
Ethyl-Tert-Butyl-Ether	103		101		70-130	2		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: ANDOVER LF

Project Number: Not Specified

Lab Number: L2369003

Report Date: 11/30/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1857208-3 WG1857208-4								
Tertiary-Amyl Methyl Ether	100		98		70-130	2		20
1,4-Dioxane	94		89		70-130	5		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	101		100		70-130
Toluene-d8	99		100		70-130
4-Bromofluorobenzene	102		101		70-130
Dibromofluoromethane	100		101		70-130

SEMIVOLATILES

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2369003
Report Date: 11/30/23

SAMPLE RESULTS

Lab ID: L2369003-01
Client ID: JW WHITE FILL
Sample Location: ANDOVER, MA

Date Collected: 11/20/23 09:30
Date Received: 11/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8270E
Analytical Date: 11/28/23 02:59
Analyst: MG
Percent Solids: 95%

Extraction Method: EPA 3546
Extraction Date: 11/26/23 14:39

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	140	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	180	--	1
Hexachlorobenzene	ND		ug/kg	74	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	74	--	1
2-Chloronaphthalene	ND		ug/kg	180	--	1
1,2-Dichlorobenzene	ND		ug/kg	180	--	1
1,3-Dichlorobenzene	ND		ug/kg	180	--	1
1,4-Dichlorobenzene	ND		ug/kg	74	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	180	--	1
2,4-Dinitrotoluene	ND		ug/kg	74	--	1
2,6-Dinitrotoluene	ND		ug/kg	180	--	1
Azobenzene	ND		ug/kg	180	--	1
Fluoranthene	ND		ug/kg	100	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	180	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	74	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	190	--	1
Hexachlorobutadiene	ND		ug/kg	180	--	1
Hexachloroethane	ND		ug/kg	74	--	1
Isophorone	ND		ug/kg	160	--	1
Naphthalene	ND		ug/kg	180	--	1
Nitrobenzene	ND		ug/kg	160	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	180	--	1
Butyl benzyl phthalate	ND		ug/kg	180	--	1
Di-n-butylphthalate	ND		ug/kg	180	--	1
Di-n-octylphthalate	ND		ug/kg	180	--	1
Diethyl phthalate	ND		ug/kg	180	--	1
Dimethyl phthalate	ND		ug/kg	74	--	1
Benzo(a)anthracene	ND		ug/kg	100	--	1

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2369003
Report Date: 11/30/23

SAMPLE RESULTS

Lab ID: L2369003-01
Client ID: JW WHITE FILL
Sample Location: ANDOVER, MA
Date Collected: 11/20/23 09:30
Date Received: 11/20/23
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(a)pyrene	ND		ug/kg	140	--	1
Benzo(b)fluoranthene	ND		ug/kg	100	--	1
Benzo(k)fluoranthene	ND		ug/kg	100	--	1
Chrysene	ND		ug/kg	100	--	1
Acenaphthylene	ND		ug/kg	140	--	1
Anthracene	ND		ug/kg	100	--	1
Benzo(ghi)perylene	ND		ug/kg	140	--	1
Fluorene	ND		ug/kg	180	--	1
Phenanthrene	ND		ug/kg	100	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	74	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	140	--	1
Pyrene	ND		ug/kg	100	--	1
Aniline	ND		ug/kg	210	--	1
4-Chloroaniline	ND		ug/kg	180	--	1
Dibenzofuran	ND		ug/kg	180	--	1
2-Methylnaphthalene	ND		ug/kg	74	--	1
Acetophenone	ND		ug/kg	180	--	1
2,4,6-Trichlorophenol	ND		ug/kg	74	--	1
2-Chlorophenol	ND		ug/kg	74	--	1
2,4-Dichlorophenol	ND		ug/kg	74	--	1
2,4-Dimethylphenol	ND		ug/kg	74	--	1
2-Nitrophenol	ND		ug/kg	380	--	1
4-Nitrophenol	ND		ug/kg	240	--	1
2,4-Dinitrophenol	ND		ug/kg	840	--	1
Pentachlorophenol	ND		ug/kg	350	--	1
Phenol	ND		ug/kg	180	--	1
2-Methylphenol	ND		ug/kg	180	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	250	--	1
2,4,5-Trichlorophenol	ND		ug/kg	180	--	1
Pyridine	ND		ug/kg	190	--	1
Biphenyl	ND		ug/kg	35	--	1

Project Name: ANDOVER LF
Lab Number: L2369003
Project Number: Not Specified
Report Date: 11/30/23

SAMPLE RESULTS

Lab ID: L2369003-01
Client ID: JW WHITE FILL
Sample Location: ANDOVER, MA
Date Collected: 11/20/23 09:30
Date Received: 11/20/23
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	62		30-130
Phenol-d6	61		30-130
Nitrobenzene-d5	59		30-130
2-Fluorobiphenyl	63		30-130
2,4,6-Tribromophenol	85		30-130
4-Terphenyl-d14	68		30-130

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2369003
Report Date: 11/30/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E
Analytical Date: 11/28/23 00:37
Analyst: MG

Extraction Method: EPA 3546
Extraction Date: 11/26/23 14:39

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01 Batch: WG1856308-1					
Acenaphthene	ND		ug/kg	130	--
1,2,4-Trichlorobenzene	ND		ug/kg	160	--
Hexachlorobenzene	ND		ug/kg	69	--
Bis(2-chloroethyl)ether	ND		ug/kg	69	--
2-Chloronaphthalene	ND		ug/kg	160	--
1,2-Dichlorobenzene	ND		ug/kg	160	--
1,3-Dichlorobenzene	ND		ug/kg	160	--
1,4-Dichlorobenzene	ND		ug/kg	69	--
3,3'-Dichlorobenzidine	ND		ug/kg	160	--
2,4-Dinitrotoluene	ND		ug/kg	69	--
2,6-Dinitrotoluene	ND		ug/kg	160	--
Azobenzene	ND		ug/kg	160	--
Fluoranthene	ND		ug/kg	98	--
4-Bromophenyl phenyl ether	ND		ug/kg	160	--
Bis(2-chloroisopropyl)ether	ND		ug/kg	69	--
Bis(2-chloroethoxy)methane	ND		ug/kg	180	--
Hexachlorobutadiene	ND		ug/kg	160	--
Hexachloroethane	ND		ug/kg	69	--
Isophorone	ND		ug/kg	150	--
Naphthalene	ND		ug/kg	160	--
Nitrobenzene	ND		ug/kg	150	--
Bis(2-ethylhexyl)phthalate	ND		ug/kg	160	--
Butyl benzyl phthalate	ND		ug/kg	160	--
Di-n-butylphthalate	ND		ug/kg	160	--
Di-n-octylphthalate	ND		ug/kg	160	--
Diethyl phthalate	ND		ug/kg	160	--
Dimethyl phthalate	ND		ug/kg	69	--
Benzo(a)anthracene	ND		ug/kg	98	--
Benzo(a)pyrene	ND		ug/kg	130	--

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2369003
Report Date: 11/30/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E
Analytical Date: 11/28/23 00:37
Analyst: MG

Extraction Method: EPA 3546
Extraction Date: 11/26/23 14:39

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01 Batch: WG1856308-1					
Benzo(b)fluoranthene	ND		ug/kg	98	--
Benzo(k)fluoranthene	ND		ug/kg	98	--
Chrysene	ND		ug/kg	98	--
Acenaphthylene	ND		ug/kg	130	--
Anthracene	ND		ug/kg	98	--
Benzo(ghi)perylene	ND		ug/kg	130	--
Fluorene	ND		ug/kg	160	--
Phenanthrene	ND		ug/kg	98	--
Dibenzo(a,h)anthracene	ND		ug/kg	69	--
Indeno(1,2,3-cd)pyrene	ND		ug/kg	130	--
Pyrene	ND		ug/kg	98	--
Aniline	ND		ug/kg	200	--
4-Chloroaniline	ND		ug/kg	160	--
Dibenzofuran	ND		ug/kg	160	--
2-Methylnaphthalene	ND		ug/kg	69	--
Acetophenone	ND		ug/kg	160	--
2,4,6-Trichlorophenol	ND		ug/kg	69	--
2-Chlorophenol	ND		ug/kg	69	--
2,4-Dichlorophenol	ND		ug/kg	69	--
2,4-Dimethylphenol	ND		ug/kg	69	--
2-Nitrophenol	ND		ug/kg	350	--
4-Nitrophenol	ND		ug/kg	230	--
2,4-Dinitrophenol	ND		ug/kg	790	--
Pentachlorophenol	ND		ug/kg	330	--
Phenol	ND		ug/kg	160	--
2-Methylphenol	ND		ug/kg	160	--
3-Methylphenol/4-Methylphenol	ND		ug/kg	240	--
2,4,5-Trichlorophenol	ND		ug/kg	160	--
Pyridine	ND		ug/kg	180	--

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2369003
Report Date: 11/30/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E
Analytical Date: 11/28/23 00:37
Analyst: MG

Extraction Method: EPA 3546
Extraction Date: 11/26/23 14:39

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01 Batch: WG1856308-1					
Biphenyl	ND		ug/kg	33	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	64		30-130
Phenol-d6	63		30-130
Nitrobenzene-d5	59		30-130
2-Fluorobiphenyl	64		30-130
2,4,6-Tribromophenol	90		30-130
4-Terphenyl-d14	71		30-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2369003
Report Date: 11/30/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01 Batch: WG1856308-2 WG1856308-3								
Acenaphthene	61		72		40-140	17		30
1,2,4-Trichlorobenzene	62		66		40-140	6		30
Hexachlorobenzene	74		89		40-140	18		30
Bis(2-chloroethyl)ether	53		58		40-140	9		30
2-Chloronaphthalene	68		77		40-140	12		30
1,2-Dichlorobenzene	55		62		40-140	12		30
1,3-Dichlorobenzene	54		61		40-140	12		30
1,4-Dichlorobenzene	55		62		40-140	12		30
3,3'-Dichlorobenzidine	79		88		40-140	11		30
2,4-Dinitrotoluene	72		86		40-140	18		30
2,6-Dinitrotoluene	72		83		40-140	14		30
Azobenzene	61		72		40-140	17		30
Fluoranthene	69		77		40-140	11		30
4-Bromophenyl phenyl ether	67		78		40-140	15		30
Bis(2-chloroisopropyl)ether	41		45		40-140	9		30
Bis(2-chloroethoxy)methane	61		64		40-140	5		30
Hexachlorobutadiene	59		71		40-140	18		30
Hexachloroethane	55		60		40-140	9		30
Isophorone	61		65		40-140	6		30
Naphthalene	66		75		40-140	13		30
Nitrobenzene	57		61		40-140	7		30
Bis(2-ethylhexyl)phthalate	74		87		40-140	16		30
Butyl benzyl phthalate	76		88		40-140	15		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2369003
Report Date: 11/30/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01 Batch: WG1856308-2 WG1856308-3								
Di-n-butylphthalate	72		84		40-140	15		30
Di-n-octylphthalate	78		90		40-140	14		30
Diethyl phthalate	67		79		40-140	16		30
Dimethyl phthalate	66		76		40-140	14		30
Benzo(a)anthracene	69		79		40-140	14		30
Benzo(a)pyrene	83		91		40-140	9		30
Benzo(b)fluoranthene	76		84		40-140	10		30
Benzo(k)fluoranthene	74		83		40-140	11		30
Chrysene	68		78		40-140	14		30
Acenaphthylene	67		77		40-140	14		30
Anthracene	72		82		40-140	13		30
Benzo(ghi)perylene	71		81		40-140	13		30
Fluorene	65		76		40-140	16		30
Phenanthrene	71		79		40-140	11		30
Dibenzo(a,h)anthracene	71		82		40-140	14		30
Indeno(1,2,3-cd)pyrene	71		82		40-140	14		30
Pyrene	67		77		40-140	14		30
Aniline	56		60		40-140	7		30
4-Chloroaniline	55		62		40-140	12		30
Dibenzofuran	65		78		40-140	18		30
2-Methylnaphthalene	66		76		40-140	14		30
Acetophenone	68		73		40-140	7		30
2,4,6-Trichlorophenol	75		86		30-130	14		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: ANDOVER LF

Project Number: Not Specified

Lab Number: L2369003

Report Date: 11/30/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01 Batch: WG1856308-2 WG1856308-3								
2-Chlorophenol	66		70		30-130	6		30
2,4-Dichlorophenol	69		72		30-130	4		30
2,4-Dimethylphenol	66		68		30-130	3		30
2-Nitrophenol	74		82		30-130	10		30
4-Nitrophenol	59		70		30-130	17		30
2,4-Dinitrophenol	54		58		30-130	7		30
Pentachlorophenol	70		81		30-130	15		30
Phenol	71		76		30-130	7		30
2-Methylphenol	65		68		30-130	5		30
3-Methylphenol/4-Methylphenol	66		70		30-130	6		30
2,4,5-Trichlorophenol	75		80		30-130	6		30
Pyridine	39		44		30-130	12		30
Biphenyl	68		78		40-140	14		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	66		69		30-130
Phenol-d6	69		72		30-130
Nitrobenzene-d5	65		68		30-130
2-Fluorobiphenyl	68		77		30-130
2,4,6-Tribromophenol	99		115		30-130
4-Terphenyl-d14	73		84		30-130

PCBS

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2369003
Report Date: 11/30/23

SAMPLE RESULTS

Lab ID: L2369003-01
Client ID: JW WHITE FILL
Sample Location: ANDOVER, MA

Date Collected: 11/20/23 09:30
Date Received: 11/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8082A
Analytical Date: 11/27/23 10:35
Analyst: RMP
Percent Solids: 95%

Extraction Method: EPA 3546
Extraction Date: 11/25/23 19:03
Cleanup Method: EPA 3665A
Cleanup Date: 11/27/23
Cleanup Method: EPA 3660B
Cleanup Date: 11/27/23

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	50.7	--	1	A
Aroclor 1221	ND		ug/kg	50.7	--	1	A
Aroclor 1232	ND		ug/kg	50.7	--	1	A
Aroclor 1242	ND		ug/kg	50.7	--	1	A
Aroclor 1248	ND		ug/kg	50.7	--	1	A
Aroclor 1254	ND		ug/kg	50.7	--	1	A
Aroclor 1260	ND		ug/kg	50.7	--	1	A
Aroclor 1262	ND		ug/kg	50.7	--	1	A
Aroclor 1268	ND		ug/kg	50.7	--	1	A
PCBs, Total	ND		ug/kg	50.7	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	73		30-150	A
Decachlorobiphenyl	67		30-150	A
2,4,5,6-Tetrachloro-m-xylene	73		30-150	B
Decachlorobiphenyl	67		30-150	B

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2369003
Report Date: 11/30/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082A
Analytical Date: 11/27/23 09:55
Analyst: RMP

Extraction Method: EPA 3546
Extraction Date: 11/25/23 19:03
Cleanup Method: EPA 3665A
Cleanup Date: 11/27/23
Cleanup Method: EPA 3660B
Cleanup Date: 11/27/23

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01 Batch: WG1856144-1						
Aroclor 1016	ND		ug/kg	49.6	--	A
Aroclor 1221	ND		ug/kg	49.6	--	A
Aroclor 1232	ND		ug/kg	49.6	--	A
Aroclor 1242	ND		ug/kg	49.6	--	A
Aroclor 1248	ND		ug/kg	49.6	--	A
Aroclor 1254	ND		ug/kg	49.6	--	A
Aroclor 1260	ND		ug/kg	49.6	--	A
Aroclor 1262	ND		ug/kg	49.6	--	A
Aroclor 1268	ND		ug/kg	49.6	--	A
PCBs, Total	ND		ug/kg	49.6	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	75		30-150	A
Decachlorobiphenyl	79		30-150	A
2,4,5,6-Tetrachloro-m-xylene	73		30-150	B
Decachlorobiphenyl	72		30-150	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: ANDOVER LF

Project Number: Not Specified

Lab Number: L2369003

Report Date: 11/30/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01 Batch: WG1856144-2 WG1856144-3									
Aroclor 1016	89		85		40-140	5		30	A
Aroclor 1260	90		87		40-140	3		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	80		82		30-150	A
Decachlorobiphenyl	88		91		30-150	A
2,4,5,6-Tetrachloro-m-xylene	78		80		30-150	B
Decachlorobiphenyl	80		83		30-150	B

PESTICIDES

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2369003
Report Date: 11/30/23

SAMPLE RESULTS

Lab ID: L2369003-01
Client ID: JW WHITE FILL
Sample Location: ANDOVER, MA

Date Collected: 11/20/23 09:30
Date Received: 11/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8081B
Analytical Date: 11/27/23 18:39
Analyst: MMG
Percent Solids: 95%

Extraction Method: EPA 3546
Extraction Date: 11/25/23 11:08
Cleanup Method: EPA 3620B
Cleanup Date: 11/26/23
Cleanup Method: EPA 3660B
Cleanup Date: 11/26/23

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Organochlorine Pesticides - Westborough Lab							
Delta-BHC	ND		ug/kg	1.63	--	1	A
Lindane	ND		ug/kg	0.543	--	1	A
Alpha-BHC	ND		ug/kg	0.679	--	1	A
Beta-BHC	ND		ug/kg	1.63	--	1	A
Heptachlor	ND		ug/kg	0.814	--	1	A
Aldrin	ND		ug/kg	1.63	--	1	A
Heptachlor epoxide	ND		ug/kg	3.05	--	1	A
Endrin	ND		ug/kg	0.679	--	1	A
Endrin ketone	ND		ug/kg	1.63	--	1	A
Dieldrin	ND		ug/kg	1.02	--	1	A
4,4'-DDE	4.48		ug/kg	1.63	--	1	A
4,4'-DDD	ND		ug/kg	1.63	--	1	A
4,4'-DDT	4.20		ug/kg	3.05	--	1	A
Endosulfan I	ND		ug/kg	1.63	--	1	A
Endosulfan II	ND		ug/kg	1.63	--	1	A
Endosulfan sulfate	ND		ug/kg	0.679	--	1	A
Methoxychlor	ND		ug/kg	3.05	--	1	A
Chlordane	ND		ug/kg	13.6	--	1	A
Hexachlorobenzene	ND		ug/kg	1.63	--	1	A
Toxaphene	ND		ug/kg	30.5	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	69		30-150	A
Decachlorobiphenyl	60		30-150	A
2,4,5,6-Tetrachloro-m-xylene	66		30-150	B
Decachlorobiphenyl	62		30-150	B

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2369003
Report Date: 11/30/23

SAMPLE RESULTS

Lab ID: L2369003-01
Client ID: JW WHITE FILL
Sample Location: ANDOVER, MA
Date Collected: 11/20/23 09:30
Date Received: 11/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8151A
Analytical Date: 11/30/23 09:39
Analyst: PEG
Percent Solids: 95%
Methylation Date: 11/30/23 05:16
Extraction Method: EPA 8151A
Extraction Date: 11/29/23 11:10

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Chlorinated Herbicides - Westborough Lab							
MCPP	ND		ug/kg	3500	--	1	A
MCPA	ND		ug/kg	3500	--	1	A
Dalapon	ND		ug/kg	35	--	1	A
Dicamba	ND		ug/kg	35	--	1	A
Dichloroprop	ND		ug/kg	35	--	1	A
2,4-D	ND		ug/kg	35	--	1	A
2,4-DB	ND		ug/kg	35	--	1	A
2,4,5-T	ND		ug/kg	35	--	1	A
2,4,5-TP (Silvex)	ND		ug/kg	35	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DCAA	83		30-150	A
DCAA	82		30-150	B

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2369003
Report Date: 11/30/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8081B
Analytical Date: 11/27/23 18:02
Analyst: MMG

Extraction Method: EPA 3546
Extraction Date: 11/25/23 11:08
Cleanup Method: EPA 3620B
Cleanup Date: 11/26/23
Cleanup Method: EPA 3660B
Cleanup Date: 11/26/23

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Organochlorine Pesticides - Westborough Lab for sample(s): 01 Batch: WG1856079-1						
Delta-BHC	ND		ug/kg	1.57	--	A
Lindane	ND		ug/kg	0.523	--	A
Alpha-BHC	ND		ug/kg	0.654	--	A
Beta-BHC	ND		ug/kg	1.57	--	A
Heptachlor	ND		ug/kg	0.785	--	A
Aldrin	ND		ug/kg	1.57	--	A
Heptachlor epoxide	ND		ug/kg	2.94	--	A
Endrin	ND		ug/kg	0.654	--	A
Endrin ketone	ND		ug/kg	1.57	--	A
Dieldrin	ND		ug/kg	0.981	--	A
4,4'-DDE	ND		ug/kg	1.57	--	A
4,4'-DDD	ND		ug/kg	1.57	--	A
4,4'-DDT	ND		ug/kg	2.94	--	A
Endosulfan I	ND		ug/kg	1.57	--	A
Endosulfan II	ND		ug/kg	1.57	--	A
Endosulfan sulfate	ND		ug/kg	0.654	--	A
Methoxychlor	ND		ug/kg	2.94	--	A
Chlordane	ND		ug/kg	13.1	--	A
Hexachlorobenzene	ND		ug/kg	1.57	--	A
Toxaphene	ND		ug/kg	29.4	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	71		30-150	A
Decachlorobiphenyl	63		30-150	A
2,4,5,6-Tetrachloro-m-xylene	68		30-150	B
Decachlorobiphenyl	65		30-150	B

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2369003
Report Date: 11/30/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8151A
Analytical Date: 11/30/23 08:45
Analyst: PEG

Extraction Method: EPA 8151A
Extraction Date: 11/29/23 11:10

Methylation Date: 11/30/23 05:16

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Chlorinated Herbicides - Westborough Lab for sample(s): 01 Batch: WG1857573-1						
MCPP	ND		ug/kg	3300	--	A
MCPA	ND		ug/kg	3300	--	A
Dalapon	ND		ug/kg	33	--	A
Dicamba	ND		ug/kg	33	--	A
Dichloroprop	ND		ug/kg	33	--	A
2,4-D	ND		ug/kg	33	--	A
2,4-DB	ND		ug/kg	33	--	A
2,4,5-T	ND		ug/kg	33	--	A
2,4,5-TP (Silvex)	ND		ug/kg	33	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
DCAA	79		30-150	A
DCAA	81		30-150	B

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2369003
Report Date: 11/30/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Organochlorine Pesticides - Westborough Lab Associated sample(s): 01 Batch: WG1856079-2 WG1856079-3									
Delta-BHC	70		89		40-140	24		30	A
Lindane	66		81		40-140	20		30	A
Alpha-BHC	70		84		40-140	18		30	A
Beta-BHC	80		98		40-140	20		30	A
Heptachlor	65		78		40-140	18		30	A
Aldrin	66		81		40-140	20		30	A
Heptachlor epoxide	57		70		40-140	20		30	A
Endrin	64		81		40-140	23		30	A
Endrin ketone	65		84		40-140	26		30	A
Dieldrin	70		87		40-140	22		30	A
4,4'-DDE	66		84		40-140	24		30	A
4,4'-DDD	70		90		40-140	25		30	A
4,4'-DDT	64		82		40-140	25		30	A
Endosulfan I	63		78		40-140	21		30	A
Endosulfan II	65		83		40-140	24		30	A
Endosulfan sulfate	61		78		40-140	24		30	A
Methoxychlor	59		78		40-140	28		30	A
Hexachlorobenzene	63		77		40-140	20		30	A

Lab Control Sample Analysis

Batch Quality Control

Project Name: ANDOVER LF

Project Number: Not Specified

Lab Number: L2369003

Report Date: 11/30/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Organochlorine Pesticides - Westborough Lab Associated sample(s): 01 Batch: WG1856079-2 WG1856079-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	54		69		30-150	A
Decachlorobiphenyl	44		67		30-150	A
2,4,5,6-Tetrachloro-m-xylene	52		66		30-150	B
Decachlorobiphenyl	45		68		30-150	B

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2369003
Report Date: 11/30/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Chlorinated Herbicides - Westborough Lab Associated sample(s): 01 Batch: WG1857573-2 WG1857573-3									
MCPP	104		105		40-140	1		30	A
MCPA	82		82		40-140	0		30	A
Dalapon	43		50		40-140	15		30	A
Dicamba	98		97		40-140	1		30	A
Dichloroprop	96		92		40-140	4		30	A
2,4-D	97		97		40-140	0		30	A
2,4-DB	94		87		40-140	8		30	A
2,4,5-T	98		96		40-140	2		30	A
2,4,5-TP (Silvex)	95		93		40-140	2		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
DCAA	85		85		30-150	A
DCAA	95		90		30-150	B

METALS

Project Name: ANDOVER LF
Lab Number: L2369003
Project Number: Not Specified
Report Date: 11/30/23

SAMPLE RESULTS

Lab ID: L2369003-01
Client ID: JW WHITE FILL
Sample Location: ANDOVER, MA
Date Collected: 11/20/23 09:30
Date Received: 11/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 95%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.06	--	1	11/21/23 07:45	11/21/23 14:25	EPA 3050B	97,6010D	DHL
Arsenic, Total	6.58		mg/kg	0.412	--	1	11/21/23 07:45	11/21/23 12:14	EPA 3050B	97,6010D	JMF
Barium, Total	29.2		mg/kg	0.412	--	1	11/21/23 07:45	11/21/23 14:25	EPA 3050B	97,6010D	DHL
Beryllium, Total	0.675		mg/kg	0.206	--	1	11/21/23 07:45	11/21/23 12:14	EPA 3050B	97,6010D	JMF
Cadmium, Total	ND		mg/kg	0.412	--	1	11/21/23 07:45	11/21/23 12:14	EPA 3050B	97,6010D	JMF
Chromium, Total	21.6		mg/kg	0.412	--	1	11/21/23 07:45	11/21/23 12:14	EPA 3050B	97,6010D	JMF
Lead, Total	6.42		mg/kg	2.06	--	1	11/21/23 07:45	11/21/23 12:14	EPA 3050B	97,6010D	JMF
Mercury, Total	ND		mg/kg	0.069	--	1	11/22/23 09:40	11/22/23 19:46	EPA 7471B	97,7471B	GMG
Nickel, Total	13.8		mg/kg	1.03	--	1	11/21/23 07:45	11/21/23 14:25	EPA 3050B	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.06	--	1	11/21/23 07:45	11/21/23 12:14	EPA 3050B	97,6010D	JMF
Silver, Total	ND		mg/kg	0.412	--	1	11/21/23 07:45	11/21/23 12:14	EPA 3050B	97,6010D	JMF
Thallium, Total	ND		mg/kg	2.06	--	1	11/21/23 07:45	11/21/23 12:14	EPA 3050B	97,6010D	JMF
Vanadium, Total	14.2		mg/kg	0.412	--	1	11/21/23 07:45	11/21/23 12:14	EPA 3050B	97,6010D	JMF
Zinc, Total	17.3		mg/kg	2.06	--	1	11/21/23 07:45	11/21/23 12:14	EPA 3050B	97,6010D	JMF

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2369003
Report Date: 11/30/23

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1854848-1										
Mercury, Total	ND		mg/kg	0.083	--	1	11/22/23 09:40	11/22/23 18:24	97,7471B	GMG

Prep Information

Digestion Method: EPA 7471B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1854991-1										
Antimony, Total	ND		mg/kg	2.00	--	1	11/21/23 07:45	11/21/23 14:15	97,6010D	DHL
Arsenic, Total	ND		mg/kg	0.400	--	1	11/21/23 07:45	11/21/23 10:12	97,6010D	JMF
Barium, Total	ND		mg/kg	0.400	--	1	11/21/23 07:45	11/21/23 10:12	97,6010D	JMF
Beryllium, Total	ND		mg/kg	0.200	--	1	11/21/23 07:45	11/21/23 10:12	97,6010D	JMF
Cadmium, Total	ND		mg/kg	0.400	--	1	11/21/23 07:45	11/21/23 10:12	97,6010D	JMF
Chromium, Total	ND		mg/kg	0.400	--	1	11/21/23 07:45	11/21/23 10:12	97,6010D	JMF
Lead, Total	ND		mg/kg	2.00	--	1	11/21/23 07:45	11/21/23 10:12	97,6010D	JMF
Nickel, Total	ND		mg/kg	1.00	--	1	11/21/23 07:45	11/21/23 14:15	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.00	--	1	11/21/23 07:45	11/21/23 10:12	97,6010D	JMF
Silver, Total	ND		mg/kg	0.400	--	1	11/21/23 07:45	11/21/23 10:12	97,6010D	JMF
Thallium, Total	ND		mg/kg	2.00	--	1	11/21/23 07:45	11/21/23 10:12	97,6010D	JMF
Vanadium, Total	ND		mg/kg	0.400	--	1	11/21/23 07:45	11/21/23 10:12	97,6010D	JMF
Zinc, Total	ND		mg/kg	2.00	--	1	11/21/23 07:45	11/21/23 10:12	97,6010D	JMF

Prep Information

Digestion Method: EPA 3050B

Lab Control Sample Analysis

Batch Quality Control

Project Name: ANDOVER LF

Project Number: Not Specified

Lab Number: L2369003

Report Date: 11/30/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1854848-2 WG1854848-3 SRM Lot Number: D122-540								
Mercury, Total	89		88		73-127	1		30
MCP Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1854991-2 WG1854991-3 SRM Lot Number: D122-540								
Antimony, Total	160		162		6-194	1		30
Arsenic, Total	101		99		81-119	2		30
Barium, Total	97		93		83-117	4		30
Beryllium, Total	99		97		83-117	2		30
Cadmium, Total	97		99		83-117	2		30
Chromium, Total	98		103		82-118	5		30
Lead, Total	99		97		83-117	2		30
Nickel, Total	96		98		83-117	2		30
Selenium, Total	106		108		81-119	2		30
Silver, Total	101		102		80-120	1		30
Thallium, Total	99		90		81-119	10		30
Vanadium, Total	94		96		80-120	2		30
Zinc, Total	93		95		82-119	2		30

INORGANICS
&
MISCELLANEOUS

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2369003
Report Date: 11/30/23

SAMPLE RESULTS

Lab ID: L2369003-01
Client ID: JW WHITE FILL
Sample Location: ANDOVER, MA

Date Collected: 11/20/23 09:30
Date Received: 11/20/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	94.7		%	0.100	NA	1	-	11/21/23 00:31	121,2540G	WJM

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2369003
Report Date: 11/30/23

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2369003-01A	Vial MeOH preserved	A	NA		5.4	Y	Absent		MCP-8260HLW-21(14)
L2369003-01B	Vial water preserved	A	NA		5.4	Y	Absent	20-NOV-23 15:45	MCP-8260HLW-21(14)
L2369003-01C	Vial water preserved	A	NA		5.4	Y	Absent	20-NOV-23 15:45	MCP-8260HLW-21(14)
L2369003-01D	Plastic 2oz unpreserved for TS	A	NA		5.4	Y	Absent		TS(7)
L2369003-01E	Metals Only-Glass 60mL/2oz unpreserved	A	NA		5.4	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-CD-6010T-10(180),MCP-TL-6010T-10(180),MCP-7471T-10(28),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-ZN-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L2369003-01F	Glass 500ml/16oz unpreserved	A	NA		5.4	Y	Absent		MCP-8082-10(365),MCP-8081-10(14),MCP-8151-10(14),MCP-8270-21(14)

*Values in parentheses indicate holding time in days

Project Name:	ANDOVER LF	**Lab Number:**	L2369003
Project Number:	Not Specified	**Report Date:**	11/30/23

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name:	ANDOVER LF	**Lab Number:**	L2369003
Project Number:	Not Specified	**Report Date:**	11/30/23

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report

Project Name:	ANDOVER LF	**Lab Number:**	L2369003
Project Number:	Not Specified	**Report Date:**	11/30/23

Data Qualifiers

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: Data Usability Report

Project Name:	ANDOVER LF	**Lab Number:**	L2369003
Project Number:	Not Specified	**Report Date:**	11/30/23

REFERENCES

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

141 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA and IIB, November 2021.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

ALPHA ANALYTICAL
8 Walkup Drive
Westboro, MA 01581
Tel: 508-898-9220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

Date Rec'd in Lab: 11/20/23

ALPHA Job #: L2369003

Client Information

Client: J Bates and Son
Address: 57 Lawrence St.
Clinton MA 01510
Phone: 978-368-7001
Email: smcnally@jbatesandson.com

Project Information

Project Name: Andover LF
Project Location: Andover MA
Project #:
Project Manager: Jennifer Byrnes
ALPHA Quote #:

Report Information - Data Deliverables

☐ ADEx ☑ EMAIL

Billing Information

☑ Same as Client info PO #: Andover

Regulatory Requirements & Project Information Requirements

☑ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods
☐ Yes ☐ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☐ No NPDES RGP
☐ Other State /Fed Program _____ Criteria _____

Turn-Around Time

☑ Standard ☐ RUSH (only confirmed if pre-approved!)
Date Due:

Additional Project Information:

* See bottle order request #444745 for analysis

ANALYSIS

VOC: ☐ 8260 ☐ 624 ☐ 524.2
SVOC: ☐ ABN ☐ PAH
METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15
METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13
EPH: ☐ Ranges & Targets ☐ Ranges Only
VPH: ☐ Ranges & Targets ☐ Ranges Only
☐ PCB ☐ PEST
TPH: ☐ Quant Only ☐ Fingerprint

SAMPLE INFO
Filtration
☐ Field
☐ Lab to do
Preservation
☐ Lab to do

Sample Comments

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	TOTAL # BOTTLES
L2003-01	JW White Fill	11/20/23	9:30		AMM	

Container Type	
Preservative	

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H = $Na_2S_2O_3$
I= Ascorbic Acid
J = NH_4Cl
K= Zn Acetate
O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
Seth McNally	11/20/23 2:34	[signature] AM	11/20/23 14:34

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

Method Blank Summary
Form 4
Volatiles

Client	: J. Bates & Son, LLC	**Lab Number**	: L2369003
Project Name	: ANDOVER LF	**Project Number**	:
Lab Sample ID	: WG1857208-5	**Lab File ID**	: V11231128A05
Instrument ID	: VOA111		
Matrix	: SOIL	**Analysis Date**	: 11/28/23 09:04

Client Sample No.	Lab Sample ID	Analysis Date
WG1857208-3LCS	WG1857208-3	11/28/23 07:48
WG1857208-4LCSD	WG1857208-4	11/28/23 08:13
JW WHITE FILL	L2369003-01	11/28/23 11:36

Calibration Verification Summary
Form 7
Volatiles

Client	: J. Bates & Son, LLC	**Lab Number**	: L2369003		
Project Name	: ANDOVER LF	**Project Number**	:		
Instrument ID	: VOA111	**Calibration Date**	: 11/28/23 07:22		
Lab File ID	: V11231128A01	**Init. Calib. Date(s)**	: 11/21/23	11/22/23	
Sample No	: WG1857208-2	**Init. Calib. Times**	: 22:03	02:42	
Channel	:				

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
Fluorobenzene	1	1	-	0	20	96	0
Dichlorodifluoromethane	0.222	0.275	-	-23.9*	20	100	0
Chloromethane	0.21	0.271	-	-29*	20	109	0
Vinyl chloride	0.225	0.287	-	-27.6*	20	102	0
Bromomethane	0.222	0.221	-	0.5	20	94	0
Chloroethane	0.124	0.164	-	-32.3*	20	111	0
Trichlorofluoromethane	0.278	0.329	-	-18.3	20	96	0
Ethyl ether	0.073	0.086	-	-17.8	20	97	0
1,1-Dichloroethene	0.165	0.189	-	-14.5	20	93	0
Carbon disulfide	0.594	0.675	-	-13.6	20	96	0
Freon-113	0.186	0.219	-	-17.7	20	96	0
Acrolein	0.016	0.022	-	-37.5*	20	133	0
Methylene chloride	0.22	0.224	-	-1.8	20	95	0
Acetone	0.027	0.033	-	-22.2*	20	118	0
trans-1,2-Dichloroethene	0.198	0.219	-	-10.6	20	92	0
Methyl acetate	0.066	0.079	-	-19.7	20	105	0
Methyl tert-butyl ether	0.384	0.434	-	-13	20	96	0
tert-Butyl alcohol	0.00935	0.01061	-	-13.5	20	104	0
Diisopropyl ether	0.51	0.619	-	-21.4*	20	101	0
1,1-Dichloroethane	0.344	0.399	-	-16	20	97	0
Halothane	0.154	0.169	-	-9.7	20	91	0
Acrylonitrile	40	47.911	-	-19.8	20	113	0
Ethyl tert-butyl ether	0.501	0.565	-	-12.8	20	95	0
Vinyl acetate	0.259	0.359	-	-38.6*	20	118	0
cis-1,2-Dichloroethene	0.226	0.242	-	-7.1	20	89	0
2,2-Dichloropropane	0.286	0.34	-	-18.9	20	99	0
Bromochloromethane	0.098	0.107	-	-9.2	20	88	0
Cyclohexane	40	48.072	-	-20.2*	20	105	0
Chloroform	0.372	0.402	-	-8.1	20	90	0
Ethyl acetate	0.094	0.112	-	-19.1	20	104	0
Carbon tetrachloride	0.279	0.317	-	-13.6	20	92	0
Tetrahydrofuran	0.023	0.029	-	-26.1*	20	108	0
Dibromofluoromethane	0.253	0.25	-	1.2	20	95	0
1,1,1-Trichloroethane	0.305	0.353	-	-15.7	20	93	0
2-Butanone	0.037	0.044	-	-18.9	20	97	-.01
1,1-Dichloropropene	0.239	0.298	-	-24.7*	20	98	0
Benzene	0.761	0.853	-	-12.1	20	94	0
tert-Amyl methyl ether	0.444	0.473	-	-6.5	20	90	0
1,2-Dichloroethane-d4	0.209	0.214	-	-2.4	20	100	0
1,2-Dichloroethane	0.226	0.253	-	-11.9	20	95	0
Methyl cyclohexane	40	44.133	-	-10.3	20	98	0
Trichloroethene	0.203	0.233	-	-14.8	20	95	0
Dibromomethane	0.11	0.118	-	-7.3	20	91	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: J. Bates & Son, LLC		**Lab Number**	: L2369003	
Project Name	: ANDOVER LF		**Project Number**	:	
Instrument ID	: VOA111		**Calibration Date**	: 11/28/23 07:22	
Lab File ID	: V11231128A01		**Init. Calib. Date(s)**	: 11/21/23	11/22/23
Sample No	: WG1857208-2		**Init. Calib. Times**	: 22:03	02:42
Channel	:				

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
1,2-Dichloropropane	0.189	0.218	-	-15.3	20	97	-.01
2-Chloroethyl vinyl ether	0.051	0.055	-	-7.8	20	86	0
Bromodichloromethane	0.262	0.289*	-	-10.3	20	90	0
1,4-Dioxane	2000	2281.81	-	-14.1	20	106	0
cis-1,3-Dichloropropene	0.287	0.334	-	-16.4	20	93	0
Chlorobenzene-d5	1	1	-	0	20	96	0
Toluene-d8	1.137	1.159	-	-1.9	20	97	0
Toluene	0.566	0.62	-	-9.5	20	93	0
4-Methyl-2-pentanone	40	39.633	-	0.9	20	96	0
Tetrachloroethene	0.251	0.287	-	-14.3	20	90	0
trans-1,3-Dichloropropene	0.277	0.319	-	-15.2	20	94	0
Ethyl methacrylate	40	39.394	-	1.5	20	96	0
1,1,2-Trichloroethane	0.137	0.151*	-	-10.2	20	93	0
Chlorodibromomethane	40	39.781	-	0.5	20	86	0
1,3-Dichloropropane	0.273	0.302	-	-10.6	20	93	0
1,2-Dibromoethane	40	38.549	-	3.6	20	89	0
2-Hexanone	40	40.177	-	-0.4	20	97	0
Chlorobenzene	0.678	0.716	-	-5.6	20	90	0
Ethylbenzene	1.084	1.224	-	-12.9	20	93	0
1,1,1,2-Tetrachloroethane	0.235	0.256	-	-8.9	20	88	0
p/m Xylene	0.423	0.484	-	-14.4	20	92	0
o Xylene	0.424	0.467	-	-10.1	20	90	0
Styrene	80	82.536	-	-3.2	20	89	0
1,4-Dichlorobenzene-d4	1	1	-	0	20	95	0
Bromoform	40	33.535	-	16.2	20	83	0
Isopropylbenzene	1.947	2.237	-	-14.9	20	92	0
4-Bromofluorobenzene	0.676	0.687	-	-1.6	20	96	0
Bromobenzene	0.55	0.559	-	-1.6	20	85	0
n-Propylbenzene	2.273	2.686	-	-18.2	20	95	0
1,4-Dichlorobutane	0.396	0.471	-	-18.9	20	102	0
1,1,2,2-Tetrachloroethane	0.326	0.363	-	-11.3	20	91	0
4-Ethyltoluene	1.951	2.249	-	-15.3	20	93	0
2-Chlorotoluene	1.388	1.546	-	-11.4	20	94	0
1,3,5-Trimethylbenzene	1.709	1.945	-	-13.8	20	92	0
1,2,3-Trichloropropane	0.262	0.282	-	-7.6	20	93	0
trans-1,4-Dichloro-2-buten	0.082	0.102	-	-24.4*	20	107	0
4-Chlorotoluene	1.427	1.613	-	-13	20	93	0
tert-Butylbenzene	1.453	1.647	-	-13.4	20	91	0
1,2,4-Trimethylbenzene	1.675	1.891	-	-12.9	20	92	0
sec-Butylbenzene	40	42.384	-	-6	20	94	0
p-Isopropyltoluene	40	41.268	-	-3.2	20	92	0
1,3-Dichlorobenzene	1.056	1.131	-	-7.1	20	90	0
1,4-Dichlorobenzene	1.068	1.127	-	-5.5	20	90	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: J. Bates & Son, LLC		**Lab Number**	: L2369003	
Project Name	: ANDOVER LF		**Project Number**	:	
Instrument ID	: VOA111		**Calibration Date**	: 11/28/23 07:22	
Lab File ID	: V11231128A01		**Init. Calib. Date(s)**	: 11/21/23	11/22/23
Sample No	: WG1857208-2		**Init. Calib. Times**	: 22:03	02:42
Channel	:				

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
p-Diethylbenzene	1.17	1.316	-	-12.5	20	92	0
n-Butylbenzene	40	43.861	-	-9.7	20	97	0
1,2-Dichlorobenzene	0.979	1.009	-	-3.1	20	89	0
1,2,4,5-Tetramethylbenzene	1.837	1.954	-	-6.4	20	89	0
1,2-Dibromo-3-chloropropan	40	36.815	-	8	20	89	0
1,3,5-Trichlorobenzene	0.809	0.887	-	-9.6	20	92	0
Hexachlorobutadiene	0.397	0.438	-	-10.3	20	87	0
1,2,4-Trichlorobenzene	0.648	0.7	-	-8	20	90	0
Naphthalene	1.013	1.053	-	-3.9	20	87	0
1,2,3-Trichlorobenzene	0.525	0.545	-	-3.8	20	87	0

*** Value outside of QC limits.**

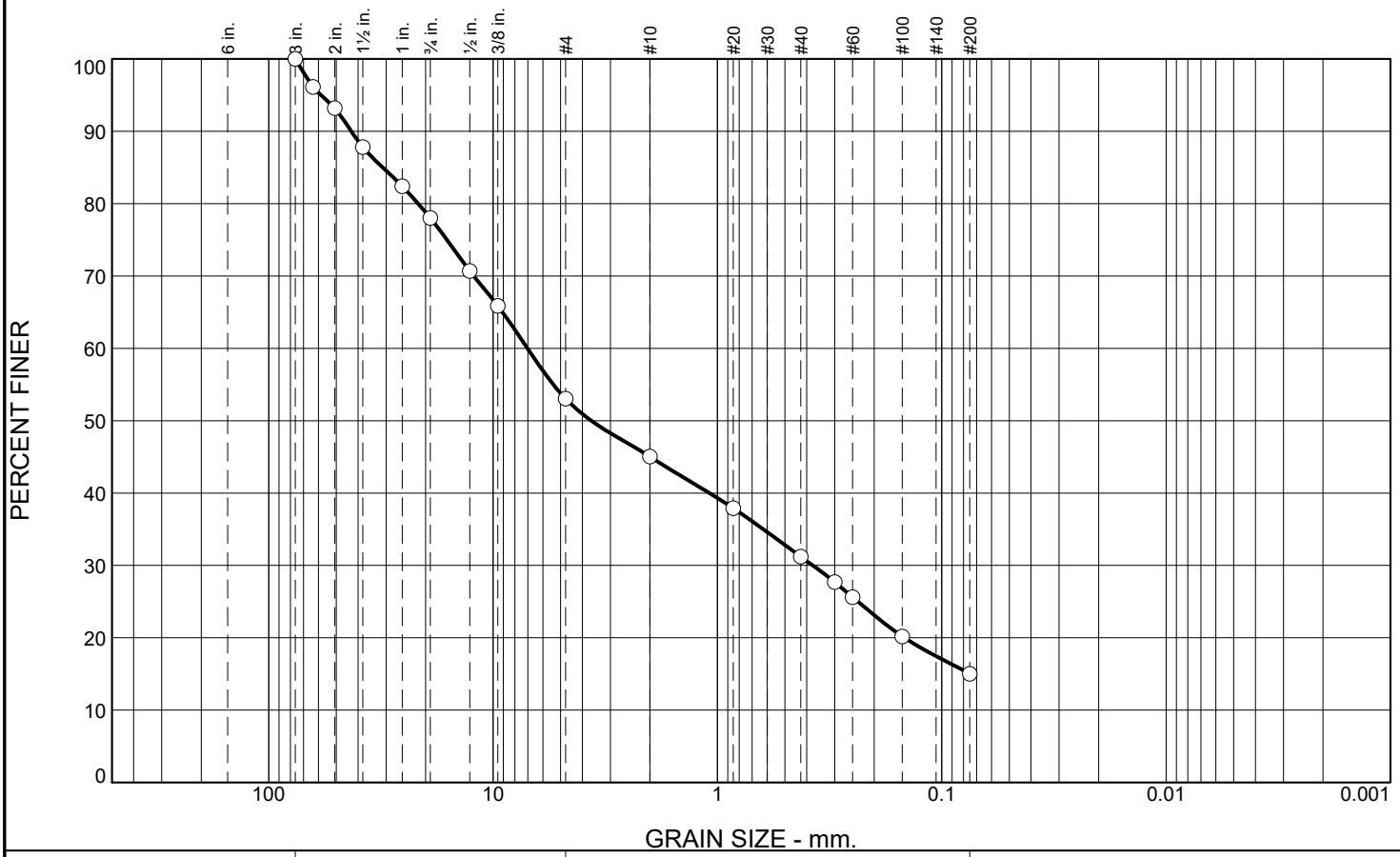
Performance Evaluation Mixture Summary
Form 15
Pesticides

Client	: J. Bates & Son, LLC	**Lab Number**	: L2369003
Project Name	: ANDOVER LF	**Project Number**	:
Instrument ID	: PEST20	**Analysis Date**	: 11/27/23 11:30
PEM Standard	: R1768108-1		
Column 1	: RTX-5	**Column 2**	: RTX-CLPPesticides2

Parameter	Signal 1	Signal 2
4,4'-DDE	270781.36389	191348.85793
Endrin	103610842.7217	109229002.38225
4,4'-DDD	402201.5218	318132.22209
4,4'-DDT	181588626.63681	189039722.47941
Endrin Aldehyde	0	0
Endrin Ketone	430687.37809	459133.23531

Parameter	%Breakdown 1	%Breakdown 2
Endrin	0.414	0.418
DDT	0.369	0.269

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	22.0	25.0	8.0	13.8	16.2	15.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3"	100.0		
2-1/2"	96.1		
2"	93.2		
1-1/2"	87.8		
1"	82.4		
3/4"	78.0		
1/2"	70.7		
3/8"	65.9		
#4	53.0		
#10	45.0		
#20	37.9		
#40	31.2		
#50	27.7		
#60	25.6		
#100	20.2		
#200	15.0		

* (no specification provided)

Material Description

Brown 3" max silty gravel and sand
D-1557 proctor = 138.8 pcf @ 5.2% optimum moisture

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 31.0708 D_{60}= 7.0297 D_{50}= 3.6521
D_{30}= 0.3759 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= GM AASHTO= A-1-b

Remarks

Sample submitted by client on 12/13/23
No soil specs provided

Sample No.: L-33869 **Source of Sample:** Peabody SLF **Date:** 12/18/23
Location: Wood Trucking Farm - 3" Gravel **Elev./Depth:** submitted

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

ANALYTICAL REPORT

Lab Number:	L2402926
Client:	J. Bates & Son, LLC P.O Box 997 Clinton, MA 01510
ATTN:	Seth Mcnally
Phone:	(978) 368-7001
Project Name:	ANDOVER LF
Project Number:	Not Specified
Report Date:	01/23/24

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2402926
Report Date: 01/23/24

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2402926-01	WOOD COMMON FILL	SOLID	ANDOVER, MA	01/18/24 10:00	01/18/24

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402926
Report Date: 01/23/24

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	YES

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	ANDOVER LF	**Lab Number:**	L2402926
Project Number:	Not Specified	**Report Date:**	01/23/24

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: ANDOVER LF **Lab Number:** L2402926
Project Number: Not Specified **Report Date:** 01/23/24

Case Narrative (continued)

MCP Related Narratives

Sample Receipt

The analyses performed were specified by the client.

In reference to question H:

A Matrix Spike was not submitted for the analysis of Total Metals.

Volatile Organics

L2402926-01: Initial calibration utilized a quadratic fit for: trans-1,3-dichloropropene, chlorodibromomethane, o-xylene, styrene, bromoform

In reference to question H:

L2402926-01: Initial Calibration did not meet:

Lowest Calibration Standard Minimum Response Factor: bromochloromethane (0.0875), 1,2-dichloropropane (0.1561), bromodichloromethane (0.2539), 1,4-dioxane (0.0008), cis-1,3-dichloropropene (0.2004), 1,1,2-trichloroethane (0.1315), 1,2-dibromoethane (0.1382)

Average Response Factor: 1,2-dichloropropane, bromodichloromethane, 1,4-dioxane, cis-1,3-dichloropropene, 1,1,2-trichloroethane, 1,2-dibromoethane

Verification: tetrahydrofuran (136%), 1,4-dioxane (132%)

L2402926-01: The associated continuing calibration standard is outside the acceptance criteria for several compounds; however, it is within overall method allowances. Associated results are considered to be biased high if the %D is negative and biased low if the %D is positive. A copy of the continuing calibration standard is included as an addendum to this report.

Total Metals

In reference to question H:

The WG1875843-3 LCSD recovery, associated with L2402926-01, is outside the acceptance criteria for beryllium (122%). Re-analysis of the LCSD yielded an unacceptable recovery for beryllium (129%). The LCS recovery is acceptable; therefore, no further action was taken.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Melissa Sturgis Melissa Sturgis

Title: Technical Director/Representative Date: 01/23/24

QC OUTLIER SUMMARY REPORT

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2402926
Report Date: 01/23/24

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment
MCP Volatile Organics by EPA 5035 Low - Westborough Lab								
8260D	Batch QC	WG1876752-4	Bromomethane	LCSD	69	70-130	01	potential low bias
MCP Semivolatile Organics - Westborough Lab								
8270E	Batch QC	WG1876111-2	Aniline	LCS	34	40-140	01	potential low bias
8270E	Batch QC	WG1876111-2	2,4-Dinitrophenol	LCS	18	30-130	01	potential low bias
8270E	Batch QC	WG1876111-3	Bis(2-chloroethyl)ether	LCSD	31	30	01	non-directional bias
8270E	Batch QC	WG1876111-3	Bis(2-chloroisopropyl)ether	LCSD	38	30	01	non-directional bias
8270E	Batch QC	WG1876111-3	Benzo(ghi)perylene	LCSD	62	30	01	non-directional bias
8270E	Batch QC	WG1876111-3	Dibenzo(a,h)anthracene	LCSD	46	30	01	non-directional bias
8270E	Batch QC	WG1876111-3	Indeno(1,2,3-cd)pyrene	LCSD	55	30	01	non-directional bias
8270E	Batch QC	WG1876111-3	Aniline	LCSD	32	40-140	01	potential low bias
8270E	Batch QC	WG1876111-3	2,4-Dinitrophenol	LCSD	15	30-130	01	potential low bias
MCP Total Metals - Mansfield Lab								
6010D	Batch QC	WG1875843-3	Beryllium, Total	LCSD	122	83-117	01	potential high bias

ORGANICS

VOLATILES

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402926
Report Date: 01/23/24

SAMPLE RESULTS

Lab ID: L2402926-01
Client ID: WOOD COMMON FILL
Sample Location: ANDOVER, MA
Date Collected: 01/18/24 10:00
Date Received: 01/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Solid
Analytical Method: 141,8260D
Analytical Date: 01/21/24 20:18
Analyst: JIC
Percent Solids: 98%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Methylene chloride	ND		ug/kg	3.2	--	1
1,1-Dichloroethane	ND		ug/kg	0.64	--	1
Chloroform	ND		ug/kg	0.97	--	1
Carbon tetrachloride	ND		ug/kg	0.64	--	1
1,2-Dichloropropane	ND		ug/kg	0.64	--	1
Dibromochloromethane	ND		ug/kg	0.64	--	1
1,1,2-Trichloroethane	ND		ug/kg	0.64	--	1
Tetrachloroethene	ND		ug/kg	0.32	--	1
Chlorobenzene	ND		ug/kg	0.32	--	1
Trichlorofluoromethane	ND		ug/kg	2.6	--	1
1,2-Dichloroethane	ND		ug/kg	0.64	--	1
1,1,1-Trichloroethane	ND		ug/kg	0.32	--	1
Bromodichloromethane	ND		ug/kg	0.32	--	1
trans-1,3-Dichloropropene	ND		ug/kg	0.64	--	1
cis-1,3-Dichloropropene	ND		ug/kg	0.32	--	1
1,3-Dichloropropene, Total	ND		ug/kg	0.32	--	1
1,1-Dichloropropene	ND		ug/kg	0.32	--	1
Bromoform	ND		ug/kg	2.6	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.32	--	1
Benzene	ND		ug/kg	0.32	--	1
Toluene	ND		ug/kg	0.64	--	1
Ethylbenzene	ND		ug/kg	0.64	--	1
Chloromethane	ND		ug/kg	2.6	--	1
Bromomethane	ND		ug/kg	1.3	--	1
Vinyl chloride	ND		ug/kg	0.64	--	1
Chloroethane	ND		ug/kg	1.3	--	1
1,1-Dichloroethene	ND		ug/kg	0.64	--	1
trans-1,2-Dichloroethene	ND		ug/kg	0.97	--	1

Project Name: ANDOVER LF
Lab Number: L2402926
Project Number: Not Specified
Report Date: 01/23/24

SAMPLE RESULTS

Lab ID: L2402926-01
Client ID: WOOD COMMON FILL
Sample Location: ANDOVER, MA
Date Collected: 01/18/24 10:00
Date Received: 01/18/24
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Trichloroethene	ND		ug/kg	0.32	--	1
1,2-Dichlorobenzene	ND		ug/kg	1.3	--	1
1,3-Dichlorobenzene	ND		ug/kg	1.3	--	1
1,4-Dichlorobenzene	ND		ug/kg	1.3	--	1
Methyl tert butyl ether	ND		ug/kg	1.3	--	1
p/m-Xylene	ND		ug/kg	1.3	--	1
o-Xylene	ND		ug/kg	0.64	--	1
Xylenes, Total	ND		ug/kg	0.64	--	1
cis-1,2-Dichloroethene	ND		ug/kg	0.64	--	1
1,2-Dichloroethene, Total	ND		ug/kg	0.64	--	1
Dibromomethane	ND		ug/kg	1.3	--	1
1,2,3-Trichloropropane	ND		ug/kg	1.3	--	1
Styrene	ND		ug/kg	0.64	--	1
Dichlorodifluoromethane	ND		ug/kg	6.4	--	1
Acetone	ND		ug/kg	16	--	1
Carbon disulfide	ND		ug/kg	6.4	--	1
Methyl ethyl ketone	ND		ug/kg	6.4	--	1
Methyl isobutyl ketone	ND		ug/kg	6.4	--	1
2-Hexanone	ND		ug/kg	6.4	--	1
Bromochloromethane	ND		ug/kg	1.3	--	1
Tetrahydrofuran	ND		ug/kg	2.6	--	1
2,2-Dichloropropane	ND		ug/kg	1.3	--	1
1,2-Dibromoethane	ND		ug/kg	0.64	--	1
1,3-Dichloropropane	ND		ug/kg	1.3	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	0.32	--	1
Bromobenzene	ND		ug/kg	1.3	--	1
n-Butylbenzene	ND		ug/kg	0.64	--	1
sec-Butylbenzene	ND		ug/kg	0.64	--	1
tert-Butylbenzene	ND		ug/kg	1.3	--	1
o-Chlorotoluene	ND		ug/kg	1.3	--	1
p-Chlorotoluene	ND		ug/kg	1.3	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	1.9	--	1
Hexachlorobutadiene	ND		ug/kg	2.6	--	1
Isopropylbenzene	ND		ug/kg	0.64	--	1
p-Isopropyltoluene	ND		ug/kg	0.64	--	1
Naphthalene	ND		ug/kg	2.6	--	1
n-Propylbenzene	ND		ug/kg	0.64	--	1

Project Name: ANDOVER LF
Lab Number: L2402926
Project Number: Not Specified
Report Date: 01/23/24

SAMPLE RESULTS

Lab ID: L2402926-01
Client ID: WOOD COMMON FILL
Sample Location: ANDOVER, MA
Date Collected: 01/18/24 10:00
Date Received: 01/18/24
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	1.3	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	1.3	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	1.3	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	1.3	--	1
Diethyl ether	ND		ug/kg	1.3	--	1
Diisopropyl Ether	ND		ug/kg	1.3	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	1.3	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	1.3	--	1
1,4-Dioxane	ND		ug/kg	52	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	107		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	101		70-130
Dibromofluoromethane	115		70-130

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402926
Report Date: 01/23/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 01/21/24 18:05
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1876752-5					
Methylene chloride	ND		ug/kg	5.0	--
1,1-Dichloroethane	ND		ug/kg	1.0	--
Chloroform	ND		ug/kg	1.5	--
Carbon tetrachloride	ND		ug/kg	1.0	--
1,2-Dichloropropane	ND		ug/kg	1.0	--
Dibromochloromethane	ND		ug/kg	1.0	--
1,1,2-Trichloroethane	ND		ug/kg	1.0	--
Tetrachloroethene	ND		ug/kg	0.50	--
Chlorobenzene	ND		ug/kg	0.50	--
Trichlorofluoromethane	ND		ug/kg	4.0	--
1,2-Dichloroethane	ND		ug/kg	1.0	--
1,1,1-Trichloroethane	ND		ug/kg	0.50	--
Bromodichloromethane	ND		ug/kg	0.50	--
trans-1,3-Dichloropropene	ND		ug/kg	1.0	--
cis-1,3-Dichloropropene	ND		ug/kg	0.50	--
1,3-Dichloropropene, Total	ND		ug/kg	0.50	--
1,1-Dichloropropene	ND		ug/kg	0.50	--
Bromoform	ND		ug/kg	4.0	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.50	--
Benzene	ND		ug/kg	0.50	--
Toluene	ND		ug/kg	1.0	--
Ethylbenzene	ND		ug/kg	1.0	--
Chloromethane	ND		ug/kg	4.0	--
Bromomethane	ND		ug/kg	2.0	--
Vinyl chloride	ND		ug/kg	1.0	--
Chloroethane	ND		ug/kg	2.0	--
1,1-Dichloroethene	ND		ug/kg	1.0	--
trans-1,2-Dichloroethene	ND		ug/kg	1.5	--
Trichloroethene	ND		ug/kg	0.50	--

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402926
Report Date: 01/23/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 01/21/24 18:05
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1876752-5					
1,2-Dichlorobenzene	ND		ug/kg	2.0	--
1,3-Dichlorobenzene	ND		ug/kg	2.0	--
1,4-Dichlorobenzene	ND		ug/kg	2.0	--
Methyl tert butyl ether	ND		ug/kg	2.0	--
p/m-Xylene	ND		ug/kg	2.0	--
o-Xylene	ND		ug/kg	1.0	--
Xylenes, Total	ND		ug/kg	1.0	--
cis-1,2-Dichloroethene	ND		ug/kg	1.0	--
1,2-Dichloroethene, Total	ND		ug/kg	1.0	--
Dibromomethane	ND		ug/kg	2.0	--
1,2,3-Trichloropropane	ND		ug/kg	2.0	--
Styrene	ND		ug/kg	1.0	--
Dichlorodifluoromethane	ND		ug/kg	10	--
Acetone	ND		ug/kg	25	--
Carbon disulfide	ND		ug/kg	10	--
Methyl ethyl ketone	ND		ug/kg	10	--
Methyl isobutyl ketone	ND		ug/kg	10	--
2-Hexanone	ND		ug/kg	10	--
Bromochloromethane	ND		ug/kg	2.0	--
Tetrahydrofuran	ND		ug/kg	4.0	--
2,2-Dichloropropane	ND		ug/kg	2.0	--
1,2-Dibromoethane	ND		ug/kg	1.0	--
1,3-Dichloropropane	ND		ug/kg	2.0	--
1,1,1,2-Tetrachloroethane	ND		ug/kg	0.50	--
Bromobenzene	ND		ug/kg	2.0	--
n-Butylbenzene	ND		ug/kg	1.0	--
sec-Butylbenzene	ND		ug/kg	1.0	--
tert-Butylbenzene	ND		ug/kg	2.0	--
o-Chlorotoluene	ND		ug/kg	2.0	--

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402926
Report Date: 01/23/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 01/21/24 18:05
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1876752-5					
p-Chlorotoluene	ND		ug/kg	2.0	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	3.0	--
Hexachlorobutadiene	ND		ug/kg	4.0	--
Isopropylbenzene	ND		ug/kg	1.0	--
p-Isopropyltoluene	ND		ug/kg	1.0	--
Naphthalene	ND		ug/kg	4.0	--
n-Propylbenzene	ND		ug/kg	1.0	--
1,2,3-Trichlorobenzene	ND		ug/kg	2.0	--
1,2,4-Trichlorobenzene	ND		ug/kg	2.0	--
1,3,5-Trimethylbenzene	ND		ug/kg	2.0	--
1,2,4-Trimethylbenzene	ND		ug/kg	2.0	--
Diethyl ether	ND		ug/kg	2.0	--
Diisopropyl Ether	ND		ug/kg	2.0	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	2.0	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	2.0	--
1,4-Dioxane	ND		ug/kg	80	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	99		70-130
Toluene-d8	98		70-130
4-Bromofluorobenzene	103		70-130
Dibromofluoromethane	109		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2402926
Report Date: 01/23/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1876752-3 WG1876752-4								
Methylene chloride	95		96		70-130	1		20
1,1-Dichloroethane	104		99		70-130	5		20
Chloroform	109		105		70-130	4		20
Carbon tetrachloride	118		117		70-130	1		20
1,2-Dichloropropane	100		99		70-130	1		20
Dibromochloromethane	112		114		70-130	2		20
1,1,2-Trichloroethane	102		103		70-130	1		20
Tetrachloroethene	112		109		70-130	3		20
Chlorobenzene	108		106		70-130	2		20
Trichlorofluoromethane	81		77		70-130	5		20
1,2-Dichloroethane	99		97		70-130	2		20
1,1,1-Trichloroethane	113		110		70-130	3		20
Bromodichloromethane	107		107		70-130	0		20
trans-1,3-Dichloropropene	101		99		70-130	2		20
cis-1,3-Dichloropropene	109		109		70-130	0		20
1,1-Dichloropropene	109		105		70-130	4		20
Bromoform	95		97		70-130	2		20
1,1,2,2-Tetrachloroethane	99		101		70-130	2		20
Benzene	106		103		70-130	3		20
Toluene	104		101		70-130	3		20
Ethylbenzene	105		100		70-130	5		20
Chloromethane	106		100		70-130	6		20
Bromomethane	75		**69**	Q	70-130	8		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2402926
Report Date: 01/23/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1876752-3 WG1876752-4								
Vinyl chloride	92		85		70-130	8		20
Chloroethane	76		70		70-130	8		20
1,1-Dichloroethene	77		73		70-130	5		20
trans-1,2-Dichloroethene	104		103		70-130	1		20
Trichloroethene	102		100		70-130	2		20
1,2-Dichlorobenzene	107		106		70-130	1		20
1,3-Dichlorobenzene	110		107		70-130	3		20
1,4-Dichlorobenzene	105		104		70-130	1		20
Methyl tert butyl ether	93		95		70-130	2		20
p/m-Xylene	110		106		70-130	4		20
o-Xylene	99		96		70-130	3		20
cis-1,2-Dichloroethene	102		100		70-130	2		20
Dibromomethane	102		102		70-130	0		20
1,2,3-Trichloropropane	94		95		70-130	1		20
Styrene	106		103		70-130	3		20
Dichlorodifluoromethane	106		101		70-130	5		20
Acetone	90		88		70-130	2		20
Carbon disulfide	76		72		70-130	5		20
Methyl ethyl ketone	86		85		70-130	1		20
Methyl isobutyl ketone	81		81		70-130	0		20
2-Hexanone	77		79		70-130	3		20
Bromochloromethane	109		106		70-130	3		20
Tetrahydrofuran	93		88		70-130	6		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2402926
Report Date: 01/23/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1876752-3 WG1876752-4								
2,2-Dichloropropane	110		102		70-130	8		20
1,2-Dibromoethane	108		110		70-130	2		20
1,3-Dichloropropane	105		104		70-130	1		20
1,1,1,2-Tetrachloroethane	115		114		70-130	1		20
Bromobenzene	104		105		70-130	1		20
n-Butylbenzene	110		105		70-130	5		20
sec-Butylbenzene	107		104		70-130	3		20
tert-Butylbenzene	107		104		70-130	3		20
o-Chlorotoluene	106		105		70-130	1		20
p-Chlorotoluene	107		105		70-130	2		20
1,2-Dibromo-3-chloropropane	99		104		70-130	5		20
Hexachlorobutadiene	109		105		70-130	4		20
Isopropylbenzene	106		104		70-130	2		20
p-Isopropyltoluene	110		108		70-130	2		20
Naphthalene	98		99		70-130	1		20
n-Propylbenzene	105		102		70-130	3		20
1,2,3-Trichlorobenzene	109		107		70-130	2		20
1,2,4-Trichlorobenzene	112		109		70-130	3		20
1,3,5-Trimethylbenzene	106		103		70-130	3		20
1,2,4-Trimethylbenzene	105		104		70-130	1		20
Diethyl ether	75		74		70-130	1		20
Diisopropyl Ether	100		98		70-130	2		20
Ethyl-Tert-Butyl-Ether	95		94		70-130	1		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: ANDOVER LF

Project Number: Not Specified

Lab Number: L2402926

Report Date: 01/23/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1876752-3 WG1876752-4								
Tertiary-Amyl Methyl Ether	89		91		70-130	2		20
1,4-Dioxane	90		98		70-130	9		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	94		94		70-130
Toluene-d8	98		99		70-130
4-Bromofluorobenzene	101		101		70-130
Dibromofluoromethane	102		102		70-130

SEMIVOLATILES

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402926
Report Date: 01/23/24

SAMPLE RESULTS

Lab ID: L2402926-01
Client ID: WOOD COMMON FILL
Sample Location: ANDOVER, MA

Date Collected: 01/18/24 10:00
Date Received: 01/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Solid
Analytical Method: 141,8270E
Analytical Date: 01/21/24 21:44
Analyst: SZ
Percent Solids: 98%

Extraction Method: EPA 3540C
Extraction Date: 01/19/24 11:25

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	140	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	170	--	1
Hexachlorobenzene	ND		ug/kg	71	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	71	--	1
2-Chloronaphthalene	ND		ug/kg	170	--	1
1,2-Dichlorobenzene	ND		ug/kg	170	--	1
1,3-Dichlorobenzene	ND		ug/kg	170	--	1
1,4-Dichlorobenzene	ND		ug/kg	71	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	170	--	1
2,4-Dinitrotoluene	ND		ug/kg	71	--	1
2,6-Dinitrotoluene	ND		ug/kg	170	--	1
Azobenzene	ND		ug/kg	170	--	1
Fluoranthene	ND		ug/kg	100	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	170	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	71	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	180	--	1
Hexachlorobutadiene	ND		ug/kg	170	--	1
Hexachloroethane	ND		ug/kg	71	--	1
Isophorone	ND		ug/kg	150	--	1
Naphthalene	ND		ug/kg	170	--	1
Nitrobenzene	ND		ug/kg	150	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	170	--	1
Butyl benzyl phthalate	ND		ug/kg	170	--	1
Di-n-butylphthalate	ND		ug/kg	170	--	1
Di-n-octylphthalate	ND		ug/kg	170	--	1
Diethyl phthalate	ND		ug/kg	170	--	1
Dimethyl phthalate	ND		ug/kg	71	--	1
Benzo(a)anthracene	ND		ug/kg	100	--	1

Project Name: ANDOVER LF
Lab Number: L2402926
Project Number: Not Specified
Report Date: 01/23/24

SAMPLE RESULTS

Lab ID: L2402926-01
Client ID: WOOD COMMON FILL
Sample Location: ANDOVER, MA
Date Collected: 01/18/24 10:00
Date Received: 01/18/24
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(a)pyrene	ND		ug/kg	140	--	1
Benzo(b)fluoranthene	ND		ug/kg	100	--	1
Benzo(k)fluoranthene	ND		ug/kg	100	--	1
Chrysene	ND		ug/kg	100	--	1
Acenaphthylene	ND		ug/kg	140	--	1
Anthracene	ND		ug/kg	100	--	1
Benzo(ghi)perylene	ND		ug/kg	140	--	1
Fluorene	ND		ug/kg	170	--	1
Phenanthrene	ND		ug/kg	100	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	71	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	140	--	1
Pyrene	ND		ug/kg	100	--	1
Aniline	ND		ug/kg	200	--	1
4-Chloroaniline	ND		ug/kg	170	--	1
Dibenzofuran	ND		ug/kg	170	--	1
2-Methylnaphthalene	ND		ug/kg	71	--	1
Acetophenone	ND		ug/kg	170	--	1
2,4,6-Trichlorophenol	ND		ug/kg	71	--	1
2-Chlorophenol	ND		ug/kg	71	--	1
2,4-Dichlorophenol	ND		ug/kg	71	--	1
2,4-Dimethylphenol	ND		ug/kg	71	--	1
2-Nitrophenol	ND		ug/kg	360	--	1
4-Nitrophenol	ND		ug/kg	240	--	1
2,4-Dinitrophenol	ND		ug/kg	810	--	1
Pentachlorophenol	ND		ug/kg	340	--	1
Phenol	ND		ug/kg	170	--	1
2-Methylphenol	ND		ug/kg	170	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	240	--	1
2,4,5-Trichlorophenol	ND		ug/kg	170	--	1
Pyridine	ND		ug/kg	180	--	1
Biphenyl	ND		ug/kg	34	--	1

Project Name: ANDOVER LF
Lab Number: L2402926
Project Number: Not Specified
Report Date: 01/23/24

SAMPLE RESULTS

Lab ID: L2402926-01
Client ID: WOOD COMMON FILL
Sample Location: ANDOVER, MA
Date Collected: 01/18/24 10:00
Date Received: 01/18/24
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	60		30-130
Phenol-d6	59		30-130
Nitrobenzene-d5	51		30-130
2-Fluorobiphenyl	71		30-130
2,4,6-Tribromophenol	46		30-130
4-Terphenyl-d14	76		30-130

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402926
Report Date: 01/23/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E
Analytical Date: 01/21/24 17:26
Analyst: SZ

Extraction Method: EPA 3540C
Extraction Date: 01/19/24 11:25

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01 Batch: WG1876111-1					
Acenaphthene	ND		ug/kg	130	--
1,2,4-Trichlorobenzene	ND		ug/kg	160	--
Hexachlorobenzene	ND		ug/kg	69	--
Bis(2-chloroethyl)ether	ND		ug/kg	69	--
2-Chloronaphthalene	ND		ug/kg	160	--
1,2-Dichlorobenzene	ND		ug/kg	160	--
1,3-Dichlorobenzene	ND		ug/kg	160	--
1,4-Dichlorobenzene	ND		ug/kg	69	--
3,3'-Dichlorobenzidine	ND		ug/kg	160	--
2,4-Dinitrotoluene	ND		ug/kg	69	--
2,6-Dinitrotoluene	ND		ug/kg	160	--
Azobenzene	ND		ug/kg	160	--
Fluoranthene	ND		ug/kg	99	--
4-Bromophenyl phenyl ether	ND		ug/kg	160	--
Bis(2-chloroisopropyl)ether	ND		ug/kg	69	--
Bis(2-chloroethoxy)methane	ND		ug/kg	180	--
Hexachlorobutadiene	ND		ug/kg	160	--
Hexachloroethane	ND		ug/kg	69	--
Isophorone	ND		ug/kg	150	--
Naphthalene	ND		ug/kg	160	--
Nitrobenzene	ND		ug/kg	150	--
Bis(2-ethylhexyl)phthalate	ND		ug/kg	160	--
Butyl benzyl phthalate	ND		ug/kg	160	--
Di-n-butylphthalate	ND		ug/kg	160	--
Di-n-octylphthalate	ND		ug/kg	160	--
Diethyl phthalate	ND		ug/kg	160	--
Dimethyl phthalate	ND		ug/kg	69	--
Benzo(a)anthracene	ND		ug/kg	99	--
Benzo(a)pyrene	ND		ug/kg	130	--

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2402926
Report Date: 01/23/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E
Analytical Date: 01/21/24 17:26
Analyst: SZ

Extraction Method: EPA 3540C
Extraction Date: 01/19/24 11:25

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01 Batch: WG1876111-1					
Benzo(b)fluoranthene	ND		ug/kg	99	--
Benzo(k)fluoranthene	ND		ug/kg	99	--
Chrysene	ND		ug/kg	99	--
Acenaphthylene	ND		ug/kg	130	--
Anthracene	ND		ug/kg	99	--
Benzo(ghi)perylene	ND		ug/kg	130	--
Fluorene	ND		ug/kg	160	--
Phenanthrene	ND		ug/kg	99	--
Dibenzo(a,h)anthracene	ND		ug/kg	69	--
Indeno(1,2,3-cd)pyrene	ND		ug/kg	130	--
Pyrene	ND		ug/kg	99	--
Aniline	ND		ug/kg	200	--
4-Chloroaniline	ND		ug/kg	160	--
Dibenzofuran	ND		ug/kg	160	--
2-Methylnaphthalene	ND		ug/kg	69	--
Acetophenone	ND		ug/kg	160	--
2,4,6-Trichlorophenol	ND		ug/kg	69	--
2-Chlorophenol	ND		ug/kg	69	--
2,4-Dichlorophenol	ND		ug/kg	69	--
2,4-Dimethylphenol	ND		ug/kg	69	--
2-Nitrophenol	ND		ug/kg	360	--
4-Nitrophenol	ND		ug/kg	230	--
2,4-Dinitrophenol	ND		ug/kg	790	--
Pentachlorophenol	ND		ug/kg	330	--
Phenol	ND		ug/kg	160	--
2-Methylphenol	ND		ug/kg	160	--
3-Methylphenol/4-Methylphenol	ND		ug/kg	240	--
2,4,5-Trichlorophenol	ND		ug/kg	160	--
Pyridine	ND		ug/kg	180	--

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402926
Report Date: 01/23/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E
Analytical Date: 01/21/24 17:26
Analyst: SZ

Extraction Method: EPA 3540C
Extraction Date: 01/19/24 11:25

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01 Batch: WG1876111-1					
Biphenyl	ND		ug/kg	33	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	62		30-130
Phenol-d6	65		30-130
Nitrobenzene-d5	64		30-130
2-Fluorobiphenyl	64		30-130
2,4,6-Tribromophenol	77		30-130
4-Terphenyl-d14	73		30-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2402926
Report Date: 01/23/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01 Batch: WG1876111-2 WG1876111-3								
Acenaphthene	68		58		40-140	16		30
1,2,4-Trichlorobenzene	64		59		40-140	8		30
Hexachlorobenzene	79		68		40-140	15		30
Bis(2-chloroethyl)ether	75		55		40-140	**31**	Q	30
2-Chloronaphthalene	66		56		40-140	16		30
1,2-Dichlorobenzene	68		56		40-140	19		30
1,3-Dichlorobenzene	62		54		40-140	14		30
1,4-Dichlorobenzene	63		54		40-140	15		30
3,3'-Dichlorobenzidine	50		47		40-140	6		30
2,4-Dinitrotoluene	69		61		40-140	12		30
2,6-Dinitrotoluene	78		67		40-140	15		30
Azobenzene	64		55		40-140	15		30
Fluoranthene	74		65		40-140	13		30
4-Bromophenyl phenyl ether	78		68		40-140	14		30
Bis(2-chloroisopropyl)ether	81		55		40-140	**38**	Q	30
Bis(2-chloroethoxy)methane	75		68		40-140	10		30
Hexachlorobutadiene	66		54		40-140	20		30
Hexachloroethane	73		56		40-140	26		30
Isophorone	79		70		40-140	12		30
Naphthalene	64		55		40-140	15		30
Nitrobenzene	81		69		40-140	16		30
Bis(2-ethylhexyl)phthalate	64		55		40-140	15		30
Butyl benzyl phthalate	74		64		40-140	14		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2402926
Report Date: 01/23/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01 Batch: WG1876111-2 WG1876111-3								
Di-n-butylphthalate	75		65		40-140	14		30
Di-n-octylphthalate	67		54		40-140	21		30
Diethyl phthalate	70		61		40-140	14		30
Dimethyl phthalate	68		58		40-140	16		30
Benzo(a)anthracene	72		62		40-140	15		30
Benzo(a)pyrene	71		56		40-140	24		30
Benzo(b)fluoranthene	70		54		40-140	26		30
Benzo(k)fluoranthene	61		55		40-140	10		30
Chrysene	70		60		40-140	15		30
Acenaphthylene	64		54		40-140	17		30
Anthracene	68		60		40-140	13		30
Benzo(ghi)perylene	95		50		40-140	**62**	Q	30
Fluorene	69		59		40-140	16		30
Phenanthrene	66		58		40-140	13		30
Dibenzo(a,h)anthracene	96		60		40-140	**46**	Q	30
Indeno(1,2,3-cd)pyrene	98		56		40-140	**55**	Q	30
Pyrene	73		64		40-140	13		30
Aniline	**34**	Q	**32**	Q	40-140	6		30
4-Chloroaniline	71		62		40-140	14		30
Dibenzofuran	67		58		40-140	14		30
2-Methylnaphthalene	64		56		40-140	13		30
Acetophenone	80		60		40-140	29		30
2,4,6-Trichlorophenol	78		66		30-130	17		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2402926
Report Date: 01/23/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01 Batch: WG1876111-2 WG1876111-3								
2-Chlorophenol	78		62		30-130	23		30
2,4-Dichlorophenol	73		67		30-130	9		30
2,4-Dimethylphenol	82		75		30-130	9		30
2-Nitrophenol	82		78		30-130	5		30
4-Nitrophenol	77		65		30-130	17		30
2,4-Dinitrophenol	**18**	Q	**15**	Q	30-130	18		30
Pentachlorophenol	57		52		30-130	9		30
Phenol	76		56		30-130	30		30
2-Methylphenol	79		61		30-130	26		30
3-Methylphenol/4-Methylphenol	85		66		30-130	25		30
2,4,5-Trichlorophenol	78		66		30-130	17		30
Pyridine	57		45		30-130	24		30
Biphenyl	64		54		40-140	17		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	70		65		30-130
Phenol-d6	77		58		30-130
Nitrobenzene-d5	78		65		30-130
2-Fluorobiphenyl	62		52		30-130
2,4,6-Tribromophenol	84		74		30-130
4-Terphenyl-d14	70		62		30-130

PCBS

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402926
Report Date: 01/23/24

SAMPLE RESULTS

Lab ID: L2402926-01
Client ID: WOOD COMMON FILL
Sample Location: ANDOVER, MA

Date Collected: 01/18/24 10:00
Date Received: 01/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Solid
Analytical Method: 97,8082A
Analytical Date: 01/20/24 14:55
Analyst: EMR
Percent Solids: 98%

Extraction Method: EPA 3540C
Extraction Date: 01/19/24 11:10
Cleanup Method: EPA 3665A
Cleanup Date: 01/20/24
Cleanup Method: EPA 3660B
Cleanup Date: 01/20/24

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	92.4	--	1	A
Aroclor 1221	ND		ug/kg	92.4	--	1	A
Aroclor 1232	ND		ug/kg	92.4	--	1	A
Aroclor 1242	ND		ug/kg	92.4	--	1	A
Aroclor 1248	ND		ug/kg	92.4	--	1	A
Aroclor 1254	ND		ug/kg	92.4	--	1	A
Aroclor 1260	ND		ug/kg	92.4	--	1	A
Aroclor 1262	ND		ug/kg	92.4	--	1	A
Aroclor 1268	ND		ug/kg	92.4	--	1	A
PCBs, Total	ND		ug/kg	92.4	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	56		30-150	A
Decachlorobiphenyl	54		30-150	A
2,4,5,6-Tetrachloro-m-xylene	53		30-150	B
Decachlorobiphenyl	49		30-150	B

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402926
Report Date: 01/23/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082A
Analytical Date: 01/20/24 14:25
Analyst: EMR

Extraction Method: EPA 3540C
Extraction Date: 01/19/24 11:10
Cleanup Method: EPA 3665A
Cleanup Date: 01/20/24
Cleanup Method: EPA 3660B
Cleanup Date: 01/20/24

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01 Batch: WG1876097-1						
Aroclor 1016	ND		ug/kg	91.4	--	A
Aroclor 1221	ND		ug/kg	91.4	--	A
Aroclor 1232	ND		ug/kg	91.4	--	A
Aroclor 1242	ND		ug/kg	91.4	--	A
Aroclor 1248	ND		ug/kg	91.4	--	A
Aroclor 1254	ND		ug/kg	91.4	--	A
Aroclor 1260	ND		ug/kg	91.4	--	A
Aroclor 1262	ND		ug/kg	91.4	--	A
Aroclor 1268	ND		ug/kg	91.4	--	A
PCBs, Total	ND		ug/kg	91.4	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	50		30-150	A
Decachlorobiphenyl	47		30-150	A
2,4,5,6-Tetrachloro-m-xylene	49		30-150	B
Decachlorobiphenyl	46		30-150	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: ANDOVER LF

Project Number: Not Specified

Lab Number: L2402926

Report Date: 01/23/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01 Batch: WG1876097-2 WG1876097-3									
Aroclor 1016	59		57		40-140	3		30	A
Aroclor 1260	58		54		40-140	7		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	49		48		30-150	A
Decachlorobiphenyl	47		47		30-150	A
2,4,5,6-Tetrachloro-m-xylene	47		46		30-150	B
Decachlorobiphenyl	42		40		30-150	B

PESTICIDES

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402926
Report Date: 01/23/24

SAMPLE RESULTS

Lab ID: L2402926-01
Client ID: WOOD COMMON FILL
Sample Location: ANDOVER, MA

Date Collected: 01/18/24 10:00
Date Received: 01/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Solid
Analytical Method: 97,8081B
Analytical Date: 01/21/24 16:13
Analyst: MMG
Percent Solids: 98%

Extraction Method: EPA 3540C
Extraction Date: 01/19/24 10:20
Cleanup Method: EPA 3620B
Cleanup Date: 01/20/24
Cleanup Method: EPA 3660B
Cleanup Date: 01/20/24

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Organochlorine Pesticides - Westborough Lab							
Delta-BHC	ND		ug/kg	4.77	--	1	A
Lindane	ND		ug/kg	1.59	--	1	A
Alpha-BHC	ND		ug/kg	1.99	--	1	A
Beta-BHC	ND		ug/kg	4.77	--	1	A
Heptachlor	ND		ug/kg	2.38	--	1	A
Aldrin	ND		ug/kg	4.77	--	1	A
Heptachlor epoxide	ND		ug/kg	8.94	--	1	A
Endrin	ND		ug/kg	1.99	--	1	A
Endrin ketone	ND		ug/kg	4.77	--	1	A
Dieldrin	ND		ug/kg	2.98	--	1	A
4,4'-DDE	ND		ug/kg	4.77	--	1	A
4,4'-DDD	ND		ug/kg	4.77	--	1	A
4,4'-DDT	ND		ug/kg	8.94	--	1	A
Endosulfan I	ND		ug/kg	4.77	--	1	A
Endosulfan II	ND		ug/kg	4.77	--	1	A
Endosulfan sulfate	ND		ug/kg	1.99	--	1	A
Methoxychlor	ND		ug/kg	8.94	--	1	A
Chlordane	ND		ug/kg	39.8	--	1	A
Hexachlorobenzene	ND		ug/kg	4.77	--	1	A
Toxaphene	ND		ug/kg	89.4	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	68		30-150	A
Decachlorobiphenyl	63		30-150	A
2,4,5,6-Tetrachloro-m-xylene	65		30-150	B
Decachlorobiphenyl	74		30-150	B

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402926
Report Date: 01/23/24

SAMPLE RESULTS

Lab ID: L2402926-01
Client ID: WOOD COMMON FILL
Sample Location: ANDOVER, MA
Date Collected: 01/18/24 10:00
Date Received: 01/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Solid
Analytical Method: 97,8151A
Analytical Date: 01/20/24 09:39
Analyst: JAG
Percent Solids: 98%
Methylation Date: 01/19/24 18:54
Extraction Method: EPA 8151A
Extraction Date: 01/18/24 13:19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Chlorinated Herbicides - Westborough Lab							
MCPP	ND		ug/kg	3300	--	1	A
MCPA	ND		ug/kg	3300	--	1	A
Dalapon	ND		ug/kg	33	--	1	A
Dicamba	ND		ug/kg	33	--	1	A
Dichloroprop	ND		ug/kg	33	--	1	A
2,4-D	ND		ug/kg	33	--	1	A
2,4-DB	ND		ug/kg	33	--	1	A
2,4,5-T	ND		ug/kg	33	--	1	A
2,4,5-TP (Silvex)	ND		ug/kg	33	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DCAA	90		30-150	A
DCAA	90		30-150	B

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402926
Report Date: 01/23/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8151A
Analytical Date: 01/20/24 06:54
Analyst: JAG

Extraction Method: EPA 8151A
Extraction Date: 01/18/24 07:51

Methylation Date: 01/19/24 18:54

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Chlorinated Herbicides - Westborough Lab for sample(s): 01 Batch: WG1875754-1						
MCPP	ND		ug/kg	3300	--	A
MCPA	ND		ug/kg	3300	--	A
Dalapon	ND		ug/kg	33	--	A
Dicamba	ND		ug/kg	33	--	A
Dichloroprop	ND		ug/kg	33	--	A
2,4-D	ND		ug/kg	33	--	A
2,4-DB	ND		ug/kg	33	--	A
2,4,5-T	ND		ug/kg	33	--	A
2,4,5-TP (Silvex)	ND		ug/kg	33	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
DCAA	87		30-150	A
DCAA	86		30-150	B

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402926
Report Date: 01/23/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8081B
Analytical Date: 01/21/24 15:37
Analyst: MMG

Extraction Method: EPA 3540C
Extraction Date: 01/19/24 10:20
Cleanup Method: EPA 3620B
Cleanup Date: 01/20/24
Cleanup Method: EPA 3660B
Cleanup Date: 01/20/24

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Organochlorine Pesticides - Westborough Lab for sample(s): 01 Batch: WG1876071-1						
Delta-BHC	ND		ug/kg	4.40	--	A
Lindane	ND		ug/kg	1.46	--	A
Alpha-BHC	ND		ug/kg	1.83	--	A
Beta-BHC	ND		ug/kg	4.40	--	A
Heptachlor	ND		ug/kg	2.20	--	A
Aldrin	ND		ug/kg	4.40	--	A
Heptachlor epoxide	ND		ug/kg	8.24	--	A
Endrin	ND		ug/kg	1.83	--	A
Endrin ketone	ND		ug/kg	4.40	--	A
Dieldrin	ND		ug/kg	2.75	--	A
4,4'-DDE	ND		ug/kg	4.40	--	A
4,4'-DDD	ND		ug/kg	4.40	--	A
4,4'-DDT	ND		ug/kg	8.24	--	A
Endosulfan I	ND		ug/kg	4.40	--	A
Endosulfan II	ND		ug/kg	4.40	--	A
Endosulfan sulfate	ND		ug/kg	1.83	--	A
Methoxychlor	ND		ug/kg	8.24	--	A
Chlordane	ND		ug/kg	36.6	--	A
Hexachlorobenzene	ND		ug/kg	4.40	--	A
Toxaphene	ND		ug/kg	82.4	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	67		30-150	A
Decachlorobiphenyl	61		30-150	A
2,4,5,6-Tetrachloro-m-xylene	68		30-150	B
Decachlorobiphenyl	69		30-150	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: ANDOVER LF

Project Number: Not Specified

Lab Number: L2402926

Report Date: 01/23/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Chlorinated Herbicides - Westborough Lab Associated sample(s): 01 Batch: WG1875754-2 WG1875754-3									
MCPP	110		107		40-140	3		30	A
MCPA	92		87		40-140	6		30	A
Dalapon	75		76		40-140	1		30	A
Dicamba	96		91		40-140	5		30	A
Dichloroprop	95		90		40-140	5		30	A
2,4-D	94		93		40-140	1		30	A
2,4-DB	83		69		40-140	18		30	A
2,4,5-T	95		94		40-140	1		30	A
2,4,5-TP (Silvex)	95		91		40-140	4		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
DCAA	86		83		30-150	A
DCAA	101		98		30-150	B

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2402926
Report Date: 01/23/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Organochlorine Pesticides - Westborough Lab Associated sample(s): 01 Batch: WG1876071-2 WG1876071-3									
Delta-BHC	75		66		40-140	13		30	A
Lindane	77		67		40-140	14		30	A
Alpha-BHC	76		66		40-140	14		30	A
Beta-BHC	98		77		40-140	24		30	A
Heptachlor	76		67		40-140	13		30	A
Aldrin	76		66		40-140	14		30	A
Heptachlor epoxide	58		58		40-140	0		30	A
Endrin	80		70		40-140	13		30	A
Endrin ketone	80		72		40-140	11		30	A
Dieldrin	85		74		40-140	14		30	A
4,4'-DDE	77		68		40-140	12		30	A
4,4'-DDD	79		70		40-140	12		30	A
4,4'-DDT	85		76		40-140	11		30	A
Endosulfan I	76		66		40-140	14		30	A
Endosulfan II	82		72		40-140	13		30	A
Endosulfan sulfate	75		68		40-140	10		30	A
Methoxychlor	80		72		40-140	11		30	A
Hexachlorobenzene	71		63		40-140	12		30	A

Lab Control Sample Analysis

Batch Quality Control

Project Name: ANDOVER LF

Project Number: Not Specified

Lab Number: L2402926

Report Date: 01/23/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Organochlorine Pesticides - Westborough Lab Associated sample(s): 01 Batch: WG1876071-2 WG1876071-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	70		62		30-150	A
Decachlorobiphenyl	65		55		30-150	A
2,4,5,6-Tetrachloro-m-xylene	72		61		30-150	B
Decachlorobiphenyl	73		66		30-150	B

METALS

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402926
Report Date: 01/23/24

SAMPLE RESULTS

Lab ID: L2402926-01
Client ID: WOOD COMMON FILL
Sample Location: ANDOVER, MA
Date Collected: 01/18/24 10:00
Date Received: 01/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Solid
Percent Solids: 98%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.01	--	1	01/19/24 01:50	01/19/24 10:37	EPA 3050B	97,6010D	DMC
Arsenic, Total	5.59		mg/kg	0.401	--	1	01/19/24 01:50	01/19/24 10:37	EPA 3050B	97,6010D	DMC
Barium, Total	14.2		mg/kg	0.401	--	1	01/19/24 01:50	01/19/24 10:37	EPA 3050B	97,6010D	DMC
Beryllium, Total	ND		mg/kg	0.201	--	1	01/19/24 01:50	01/19/24 10:37	EPA 3050B	97,6010D	DMC
Cadmium, Total	ND		mg/kg	0.401	--	1	01/19/24 01:50	01/19/24 10:37	EPA 3050B	97,6010D	DMC
Chromium, Total	5.05		mg/kg	0.401	--	1	01/19/24 01:50	01/19/24 10:37	EPA 3050B	97,6010D	DMC
Lead, Total	2.44		mg/kg	2.01	--	1	01/19/24 01:50	01/19/24 10:37	EPA 3050B	97,6010D	DMC
Mercury, Total	ND		mg/kg	0.076	--	1	01/19/24 02:05	01/19/24 23:22	EPA 7471B	97,7471B	GMG
Nickel, Total	3.06		mg/kg	1.00	--	1	01/19/24 01:50	01/19/24 10:37	EPA 3050B	97,6010D	DMC
Selenium, Total	ND		mg/kg	2.01	--	1	01/19/24 01:50	01/19/24 10:37	EPA 3050B	97,6010D	DMC
Silver, Total	ND		mg/kg	0.401	--	1	01/19/24 01:50	01/19/24 10:37	EPA 3050B	97,6010D	DMC
Thallium, Total	ND		mg/kg	2.01	--	1	01/19/24 01:50	01/19/24 10:37	EPA 3050B	97,6010D	DMC
Vanadium, Total	6.33		mg/kg	0.401	--	1	01/19/24 01:50	01/19/24 10:37	EPA 3050B	97,6010D	DMC
Zinc, Total	10.2		mg/kg	2.01	--	1	01/19/24 01:50	01/19/24 10:37	EPA 3050B	97,6010D	DMC

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402926
Report Date: 01/23/24

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1875843-1										
Antimony, Total	ND		mg/kg	2.00	--	1	01/19/24 01:50	01/19/24 10:03	97,6010D	DMC
Arsenic, Total	ND		mg/kg	0.400	--	1	01/19/24 01:50	01/19/24 10:03	97,6010D	DMC
Barium, Total	ND		mg/kg	0.400	--	1	01/19/24 01:50	01/19/24 10:03	97,6010D	DMC
Beryllium, Total	ND		mg/kg	0.200	--	1	01/19/24 01:50	01/19/24 10:03	97,6010D	DMC
Cadmium, Total	ND		mg/kg	0.400	--	1	01/19/24 01:50	01/19/24 10:03	97,6010D	DMC
Chromium, Total	ND		mg/kg	0.400	--	1	01/19/24 01:50	01/19/24 10:03	97,6010D	DMC
Lead, Total	ND		mg/kg	2.00	--	1	01/19/24 01:50	01/19/24 10:03	97,6010D	DMC
Nickel, Total	ND		mg/kg	1.00	--	1	01/19/24 01:50	01/19/24 10:03	97,6010D	DMC
Selenium, Total	ND		mg/kg	2.00	--	1	01/19/24 01:50	01/19/24 10:03	97,6010D	DMC
Silver, Total	ND		mg/kg	0.400	--	1	01/19/24 01:50	01/19/24 10:03	97,6010D	DMC
Thallium, Total	ND		mg/kg	2.00	--	1	01/19/24 01:50	01/19/24 10:03	97,6010D	DMC
Vanadium, Total	ND		mg/kg	0.400	--	1	01/19/24 01:50	01/19/24 10:03	97,6010D	DMC
Zinc, Total	ND		mg/kg	2.00	--	1	01/19/24 01:50	01/19/24 10:03	97,6010D	DMC

Prep Information

Digestion Method: EPA 3050B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1875844-1										
Mercury, Total	ND		mg/kg	0.083	--	1	01/19/24 02:05	01/19/24 23:02	97,7471B	GMG

Prep Information

Digestion Method: EPA 7471B

Lab Control Sample Analysis

Batch Quality Control

Project Name: ANDOVER LF

Project Number: Not Specified

Lab Number: L2402926

Report Date: 01/23/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1875843-2 WG1875843-3 SRM Lot Number: D122-540								
Antimony, Total	151		161		6-194	6		30
Arsenic, Total	106		112		81-119	6		30
Barium, Total	97		116		83-117	18		30
Beryllium, Total	106		**122**	Q	83-117	14		30
Cadmium, Total	98		105		83-117	7		30
Chromium, Total	102		110		82-118	8		30
Lead, Total	102		108		83-117	6		30
Nickel, Total	101		107		83-117	6		30
Selenium, Total	110		119		81-119	8		30
Silver, Total	110		117		80-120	6		30
Thallium, Total	100		107		81-119	7		30
Vanadium, Total	99		106		80-120	7		30
Zinc, Total	103		108		82-119	5		30
MCP Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1875844-2 WG1875844-3 SRM Lot Number: D122-540								
Mercury, Total	101		96		73-127	5		30

INORGANICS
&
MISCELLANEOUS

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2402926
Report Date: 01/23/24

SAMPLE RESULTS

Lab ID: L2402926-01
Client ID: WOOD COMMON FILL
Sample Location: ANDOVER, MA

Date Collected: 01/18/24 10:00
Date Received: 01/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Solid

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	97.5		%	0.100	NA	1	-	01/18/24 11:54	121,2540G	ROI

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2402926
Report Date: 01/23/24

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2402926-01A	Vial MeOH preserved	A	NA		4.1	Y	Absent		MCP-8260HLW-21(14)
L2402926-01B	Vial water preserved	A	NA		4.1	Y	Absent	18-JAN-24 11:35	MCP-8260HLW-21(14)
L2402926-01C	Vial water preserved	A	NA		4.1	Y	Absent	18-JAN-24 11:35	MCP-8260HLW-21(14)
L2402926-01D	Plastic 2oz unpreserved for TS	A	NA		4.1	Y	Absent		TS(7)
L2402926-01E	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.1	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-TL-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-SB-6010T-10(180),MCP-ZN-6010T-10(180),MCP-AG-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L2402926-01F	Glass 500ml/16oz unpreserved	A	NA		4.1	Y	Absent		MCP-8081-10(14),MCP-8151-10(14),MCP-8082-10-3540C(365),MCP-8270-21(14)

*Values in parentheses indicate holding time in days

Project Name:	ANDOVER LF	**Lab Number:**	L2402926
Project Number:	Not Specified	**Report Date:**	01/23/24

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name:	ANDOVER LF	**Lab Number:**	L2402926
Project Number:	Not Specified	**Report Date:**	01/23/24

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report

Project Name:	ANDOVER LF	**Lab Number:**	L2402926
Project Number:	Not Specified	**Report Date:**	01/23/24

Data Qualifiers

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: Data Usability Report

Project Name:	ANDOVER LF	**Lab Number:**	L2402926
Project Number:	Not Specified	**Report Date:**	01/23/24

REFERENCES

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010 and WSC-CAM-IIIA and IIID, January 2024.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

141 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA and IIB, November 2021.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 1/18/24

ALPHA Job #: L2402926

ALPHA ANALYTICAL
8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220
320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Client Information

Client: J Bates and Son
Address: 57 Lawrence St.
Clinton, MA 01510
Phone: 978-368-7001
Email: smcnally@jbatesandson.com

Project Information

Project Name: Andover CF
Project Location: Andover MA
Project #:
Project Manager: Jennifer Byrnes
ALPHA Quote #: 452519

Turn-Around Time

☐ Standard ☑ RUSH (only confirmed if pre-approved!)
Date Due:

Report Information - Data Deliverables

☐ ADEx ☑ EMAIL

Billing Information

☑ Same as Client info PO #: Andover

Regulatory Requirements & Project Information Requirements

☑ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods
☐ Yes ☐ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☐ No NPDES RGP
☐ Other State /Fed Program _____ Criteria _____

Additional Project Information:

See bottle order
#452519 for analysis

ANALYSIS

VOC: ☐ 8260 ☐ 624 ☐ 524.2
SVOC: ☐ ABN ☐ PAH
METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15
METALS: ☐ RCRA5 ☐ RCRA8
EPH: ☐ PP13 ☐ Ranges & Targets ☐ Ranges Only
VPH: ☐ Ranges & Targets ☐ Ranges Only
☐ PCB ☐ PEST
TPH: ☐ Quant Only ☐ Fingerprint

SAMPLE INFO
Filtration
☐ Field
☐ Lab to do
Preservation
☐ Lab to do

Sample Comments

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials
02926-01	Wood Common Fill	1/18/24	10:00		

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H = $Na_2S_2O_3$
I= Ascorbic Acid
J = NH_4Cl
K= Zn Acetate
O= Other

Container Type																								
Preservative																								

Relinquished By:	Date/Time	Received By:	Date/Time
Barry Healy	1/18/24 10:49	Celeste AAL	1/18/24 1049

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

Serial_No:01232411:03

Bottle Order Request

JAN-17-24 13:15:28

Bottle Order # 452519

Acctnum : JBATES
Company : J. Bates & Son, LLC
Contact Name : Seth McNally
Client PM :
Projectnum :
Projectname :

Request date : 01/17/24
Status : NEED
Sample delivery date :
Order taken by : Mark Oliver
Linked Call :
Projected TAT :

Completed by :
Delivery method : P/U Flanders am
Date Completed :

Matrix : SOIL
 # Samples : 2
Client IDs :

Analytes :
Total Solids - SM 2540
MCP 8081B - Organochlorine Pesticides
MCP 5035/8260D VOCs - High & Low Level
MCP 8270E - Semivolatile Organics
MCP 8082A - Polychlorinated Biphenyls
MCP 6010D/7470A - Total MCP 14 Metals
MCP 8151A - Chlorinated Herbicides

0 Trip Blanks

Container	Quantity	Analyte Label
Glass 500ml/16oz unpreserved	1	MCP-8270-21 MCP-8081-10 MCP-8082-10 MCP-8151-10
Metals Only-Glass 60mL/2oz unpn	1	MCP14
Plastic 2oz unpreserved for TS	1	TS
5 ml. Syringe for VOA	1	
Vial MeOH preserved	1	MCP-8260HLW-21 (High)
Vial water preserved	2	MCP-8260HLW-21 (Low)

Bottle Quantity Summary:

5 mL Syringe for VOA	2
Glass 500ml/16oz unpreserved	2
Metals Only-Glass 60mL/2oz unpn	2
Plastic 2oz unpreserved for TS	2
Vial MeOH preserved	2
Vial water preserved	4

Trip Blanks and Miscellaneous Field Blanks:

Special Shipping Requirements

Cooler [X] Dangerous Certified NJ Courier Pickup Label Return Shipping Labels

Pending Shipping Date(s)
01/18/24

PLEASE PUT SAMPLES ON ICE

Method Blank Summary
Form 4
Volatiles

Client	: J. Bates & Son, LLC	**Lab Number**	: L2402926
Project Name	: ANDOVER LF	**Project Number**	:
Lab Sample ID	: WG1876752-5	**Lab File ID**	: V17240121A04
Instrument ID	: VOA117		
Matrix	: SOIL	**Analysis Date**	: 01/21/24 18:05

Client Sample No.	Lab Sample ID	Analysis Date
WG1876752-3LCS	WG1876752-3	01/21/24 16:46
WG1876752-4LCSD	WG1876752-4	01/21/24 17:12
WOOD COMMON FILL	L2402926-01	01/21/24 20:18

Calibration Verification Summary
Form 7
Volatiles

Client	: J. Bates & Son, LLC	**Lab Number**	: L2402926
Project Name	: ANDOVER LF	**Project Number**	:
Instrument ID	: VOA117	**Calibration Date**	: 01/21/24 16:46
Lab File ID	: V17240121A01	**Init. Calib. Date(s)**	: 12/14/23 12/14/23
Sample No	: WG1876752-2	**Init. Calib. Times**	: 14:50 19:41
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
Fluorobenzene	1	1	-	0	20	111	0
Dichlorodifluoromethane	0.26	0.274	-	-5.4	20	135	0
Chloromethane	0.245	0.26	-	-6.1	20	131	0
Vinyl chloride	0.35	0.322	-	8	20	112	0
Bromomethane	0.404	0.303	-	25*	20	94	0
Chloroethane	0.291	0.221	-	24.1*	20	99	0
Trichlorofluoromethane	0.628	0.511	-	18.6	20	104	0
Ethyl ether	0.154	0.116	-	24.7*	20	90	0
1,1-Dichloroethene	0.355	0.274	-	22.8*	20	96	0
Carbon disulfide	1.215	0.926	-	23.8*	20	99	0
Freon-113	0.409	0.3	-	26.7*	20	94	0
Acrolein	0.017	0.018	-	-5.9	20	122	0
Methylene chloride	0.221	0.211	-	4.5	20	129	0
Acetone	40	35.964	-	10.1	20	114	0
trans-1,2-Dichloroethene	0.219	0.227	-	-3.7	20	130	0
Methyl acetate	0.079	0.067	-	15.2	20	111	0
Methyl tert-butyl ether	0.435	0.405	-	6.9	20	111	0
tert-Butyl alcohol	0.01196	0.00918*	-	23.2*	20	94	0
Diisopropyl ether	0.544	0.541	-	0.6	20	116	0
1,1-Dichloroethane	0.357	0.372	-	-4.2	20	127	0
Halothane	0.177	0.199	-	-12.4	20	142	0
Acrylonitrile	0.032	0.032	-	0	20	114	0
Ethyl tert-butyl ether	0.511	0.485	-	5.1	20	111	0
Vinyl acetate	0.298	0.309	-	-3.7	20	122	0
cis-1,2-Dichloroethene	0.24	0.245	-	-2.1	20	123	0
2,2-Dichloropropane	0.3	0.33	-	-10	20	135	0
Bromochloromethane	0.109	0.119	-	-9.2	20	130	0
Cyclohexane	0.326	0.331	-	-1.5	20	128	0
Chloroform	0.387	0.421	-	-8.8	20	131	0
Ethyl acetate	0.11	0.101	-	8.2	20	106	0
Carbon tetrachloride	0.307	0.363	-	-18.2	20	144	0
Tetrahydrofuran	0.031	0.029	-	6.5	20	111	-.01
Dibromofluoromethane	0.261	0.267	-	-2.3	20	119	0
1,1,1-Trichloroethane	0.334	0.377	-	-12.9	20	137	0
2-Butanone	0.049	0.042	-	14.3	20	111	0
1,1-Dichloropropene	0.274	0.3	-	-9.5	20	129	0
Benzene	0.79	0.837	-	-5.9	20	122	0
tert-Amyl methyl ether	0.467	0.415	-	11.1	20	100	0
1,2-Dichloroethane-d4	0.229	0.214	-	6.6	20	106	0
1,2-Dichloroethane	0.227	0.225	-	0.9	20	113	0
Methyl cyclohexane	0.385	0.394	-	-2.3	20	124	0
Trichloroethene	0.243	0.247	-	-1.6	20	120	0
Dibromomethane	0.112	0.114	-	-1.8	20	116	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: J. Bates & Son, LLC	**Lab Number**	: L2402926
Project Name	: ANDOVER LF	**Project Number**	:
Instrument ID	: VOA117	**Calibration Date**	: 01/21/24 16:46
Lab File ID	: V17240121A01	**Init. Calib. Date(s)**	: 12/14/23 12/14/23
Sample No	: WG1876752-2	**Init. Calib. Times**	: 14:50 19:41
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
1,2-Dichloropropane	0.19	0.19	-	0	20	112	0
2-Chloroethyl vinyl ether	0.086	0.035	-	59.3*	20	46	0
Bromodichloromethane	0.266	0.286*	-	-7.5	20	117	0
1,4-Dioxane	0.0013	0.00117*	-	10	20	93	0
cis-1,3-Dichloropropene	0.276	0.301	-	-9.1	20	114	0
Chlorobenzene-d5	1	1	-	0	20	107	0
Toluene-d8	1.238	1.213	-	2	20	105	0
Toluene	0.665	0.692	-	-4.1	20	118	0
4-Methyl-2-pentanone	0.05	0.041	-	18	20	88	-.01
Tetrachloroethene	0.305	0.344	-	-12.8	20	123	0
trans-1,3-Dichloropropene	40	40.356	-	-0.9	20	117	0
Ethyl methacrylate	0.2	0.173	-	13.5	20	95	0
1,1,2-Trichloroethane	0.156	0.16*	-	-2.6	20	110	0
Chlorodibromomethane	40	44.989	-	-12.5	20	119	0
1,3-Dichloropropane	0.301	0.315	-	-4.7	20	110	-.01
1,2-Dibromoethane	0.181	0.196*	-	-8.3	20	110	0
2-Hexanone	0.088	0.068	-	22.7*	20	87	0
Chlorobenzene	0.788	0.85	-	-7.9	20	119	0
Ethylbenzene	1.324	1.385	-	-4.6	20	118	0
1,1,1,2-Tetrachloroethane	0.279	0.323	-	-15.8	20	120	0
p/m Xylene	0.527	0.579	-	-9.9	20	121	0
o Xylene	80	78.863	-	1.4	20	117	0
Styrene	80	84.465	-	-5.6	20	114	0
1,4-Dichlorobenzene-d4	1	1	-	0	20	110	0
Bromoform	40	37.832	-	5.4	20	117	0
Isopropylbenzene	2.363	2.495	-	-5.6	20	120	0
4-Bromofluorobenzene	0.695	0.705	-	-1.4	20	108	0
Bromobenzene	0.586	0.612	-	-4.4	20	116	0
n-Propylbenzene	2.769	2.908	-	-5	20	120	0
1,4-Dichlorobutane	0.449	0.422	-	6	20	105	0
1,1,2,2-Tetrachloroethane	0.391	0.387	-	1	20	106	0
4-Ethyltoluene	2.339	2.514	-	-7.5	20	121	0
2-Chlorotoluene	1.526	1.617	-	-6	20	120	0
1,3,5-Trimethylbenzene	2.032	2.152	-	-5.9	20	119	0
1,2,3-Trichloropropane	0.306	0.286	-	6.5	20	106	0
trans-1,4-Dichloro-2-buten	0.093	0.093	-	0	20	110	0
4-Chlorotoluene	1.582	1.693	-	-7	20	118	0
tert-Butylbenzene	1.851	1.981	-	-7	20	122	0
1,2,4-Trimethylbenzene	1.988	2.09	-	-5.1	20	116	0
sec-Butylbenzene	2.76	2.949	-	-6.8	20	122	0
p-Isopropyltoluene	2.415	2.646	-	-9.6	20	122	0
1,3-Dichlorobenzene	1.236	1.357	-	-9.8	20	122	0
1,4-Dichlorobenzene	1.258	1.325	-	-5.3	20	119	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: J. Bates & Son, LLC		**Lab Number**	: L2402926	
Project Name	: ANDOVER LF		**Project Number**	:	
Instrument ID	: VOA117		**Calibration Date**	: 01/21/24 16:46	
Lab File ID	: V17240121A01		**Init. Calib. Date(s)**	: 12/14/23	12/14/23
Sample No	: WG1876752-2		**Init. Calib. Times**	: 14:50	19:41
Channel	:				

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
p-Diethylbenzene	1.509	1.626	-	-7.8	20	124	0
n-Butylbenzene	2.062	2.277	-	-10.4	20	122	0
1,2-Dichlorobenzene	1.131	1.215	-	-7.4	20	119	0
1,2,4,5-Tetramethylbenzene	2.281	2.469	-	-8.2	20	122	0
1,2-Dibromo-3-chloropropan	0.066	0.065	-	1.5	20	108	0
1,3,5-Trichlorobenzene	0.889	1.012	-	-13.8	20	124	0
Hexachlorobutadiene	0.405	0.442	-	-9.1	20	127	0
1,2,4-Trichlorobenzene	0.744	0.83	-	-11.6	20	122	0
Naphthalene	1.575	1.537	-	2.4	20	111	0
1,2,3-Trichlorobenzene	0.661	0.721	-	-9.1	20	120	0

*** Value outside of QC limits.**

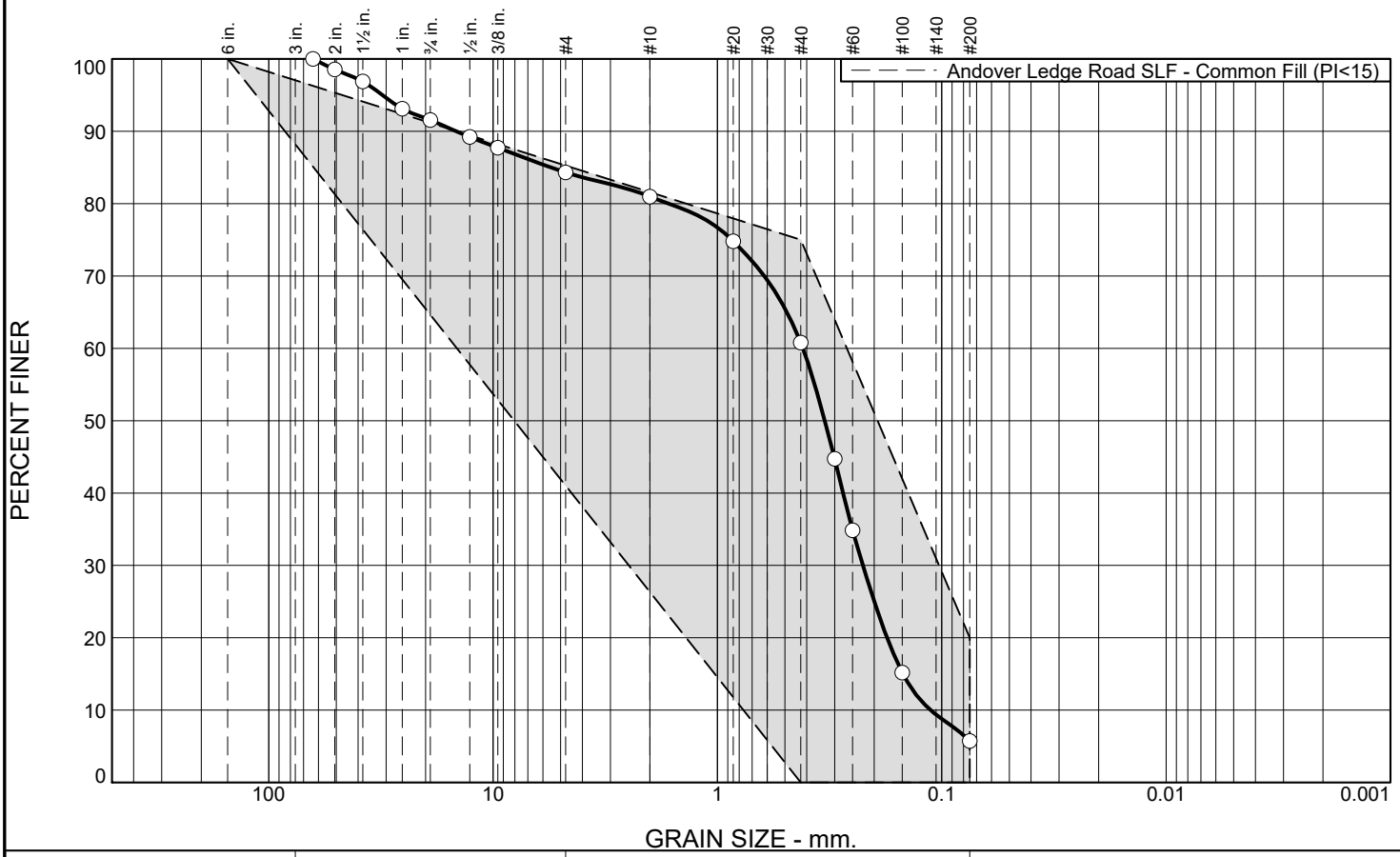
Performance Evaluation Mixture Summary
Form 15
Pesticides

Client	: J. Bates & Son, LLC	**Lab Number**	: L2402926
Project Name	: ANDOVER LF	**Project Number**	:
Instrument ID	: PEST15	**Analysis Date**	: 01/21/24 09:15
PEM Standard	: R1787101-1		
Column 1	: RTX-5	**Column 2**	: RTX-CLPPesticides2

Parameter	Signal 1	Signal 2
4,4'-DDE	314136.5462	180879.3608
Endrin	240367241.81729	140226016.39756
4,4'-DDD	3348013.25997	2032554.12784
4,4'-DDT	417728686.21317	245712869.18707
Endrin Aldehyde	348482.0688	209328.3672
Endrin Ketone	3976641.509	561782.3728

Parameter	%Breakdown 1	%Breakdown 2
Endrin	1.77	0.547
DDT	0.869	0.893

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	8.4	7.3	3.3	20.2	55.1	5.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2.5	100.0		
2	98.5		
1.5	96.9		
1	93.1		
.75	91.6		
.5	89.2		
3/8	87.7		
#4	84.3		
#10	81.0		
#20	74.8		
#40	60.8	0-75	
#50	44.7		
#60	34.9		
#100	15.2		
#200	5.7	0-20	

* Andover Ledge Road SLF - Common Fill (PI<15)

Material Description

Tan 2.5" max f/m sand little gravel trace silt
D-1557 proctor = 113.3 pcf @ 6.1% optimum moisture

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 5.5145 D_{60}= 0.4154 D_{50}= 0.3328
D_{30}= 0.2247 D_{15}= 0.1490 D_{10}= 0.1122
C_u= 3.70 C_c= 1.08

Classification

USCS= SP-SM AASHTO= A-3

Remarks

Sample was brought in by client on 06/06/24
Met project common fill gradation limits

Sample No.: L-34674 **Source of Sample:** Andover SLF **Date:** 06/12/24
Location: Marois Wilmington **Elev./Depth:**

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Capital Environmental, LLC

Environmental Engineers and Scientists

June 3, 2024

Mr. David Pallotta
P-Three, Inc.
150 Longwater Drive, Suite 102
Norwell, MA 02061-1618

RE: Native Soils Excavation and Off-Site Re-Use
Town of Wilmington, Massachusetts,
146 Middlesex Avenue, Wilmington, MA.

Dear Mr. Pallotta:

This letter has been prepared to address the e-mail request prepared by Mr. Pierre Farley of Marois Brothers, Inc. concerning off-site re-use of the soils from the Subject Site located in Wilmington, Massachusetts.

On May 5, 2024, Capital Environmental, LLC (Capital) sampled four test pits excavated by others on the Subject Site. Samples were collected from the excavated materials and composited into sterile glass containers. Three containers were generated from each test pit. All samples were screened for total organic vapor by the jar head space method for total organic vapor (TOV). No positive detections of TOV were detected in any of the samples collected.

Laboratory analysis has been performed in accordance with MassDEP sampling guidance, MassDEP analytical protocols and generally requested test parameters for Less Than RCS-1 Soil recycling. The location, name, background conditions, and testing requirements of the selected re-use location is currently unknown to Capital.

The subject soils contain no trash or debris. A small amount of loam, grass, and root matter can be observed in the material. The subject soils do not contain any spill clean-up debris or spill clean-up sand or other spilled materials. The soils do not appear to be impacted with any oils or hazardous materials because of an on-site release. It does not appear that the soils originated from any storm drain or sanitary drainage system.

The four samples were analyzed for: TPH 8100M, PCBs, Reactivity Cn/S, Corrosivity, Metals 14, Semi-Volatile Organic Compounds, Low Level Volatile Organic Compounds, Conductivity, Paint Filter, and Flash Point.

Summary Table of Laboratory Data (5/20/2024)

	Test Pit Number				RCS-1 Standards
	TP-1	**TP-2**	**TP-3**	**TP-4**	
% Solids	88.5	90.3	88.7	93.9	--
Flash Point	>200 Degree F	>200 Degree F	>200 Degree F	>200 Degree F	>140
Free Liquids	Absent	Absent	Absent	Absent	--
pH	5.9 SU	6.2 SU	5.5 SU	5.8 SU	Non-Corrosive
Specific Conductance	10.1 uS/cm	93.6 uS/cm	149 uS/cm	7.2 uS/cm	--
Reactivity Cyanide	ND	ND	ND	ND	Non-Reactive
Reactivity Sulfide	ND	ND	ND	ND	Non-Reactive
Total Metals (mg/kg)					
Antimony	ND	ND	ND	ND	20
Arsenic	7.15	7.72	5.91	8.22	20
Barium	18.3	18.1	11.3	5.62	1,000
Beryllium	ND	ND	ND	ND	90
Cadmium	ND	ND	ND	ND	70
Chromium	13.4	13.4	8.29	13.0	100
Lead	6.71	7.26	4.88	2.27	200
Mercury	ND	ND	ND	ND	20
Nickel	9.16	6.94	8.18	8.89	600
Selenium	ND	ND	ND	ND	400
Silver	ND	ND	ND	ND	100
Vanadium	17.0	19.5	8.78	9.71	400
Zinc	25.8	24.2	16.3	18.9	1,000
Thallium	ND	ND	ND	ND	8.0
VOCs (ug/kg)					
75 VOC Compounds	ND	ND	ND	See Below	
Acetone	ND	ND	ND	568	6,000
SVOCs (ug/kg)					
70 SVOCs Compounds	ND	ND	See Below	ND	
Fluoranthene	ND	ND	183	ND	1,000,000
Pyrene	ND	ND	193	ND	1,000,000
PCBs (mg/kg)					
Total PCBs (9-Aroclor)	ND	ND	ND	ND	1.0
Total Petroleum Hydrocarbons (mg/kg)	ND	ND	ND	ND	1,000

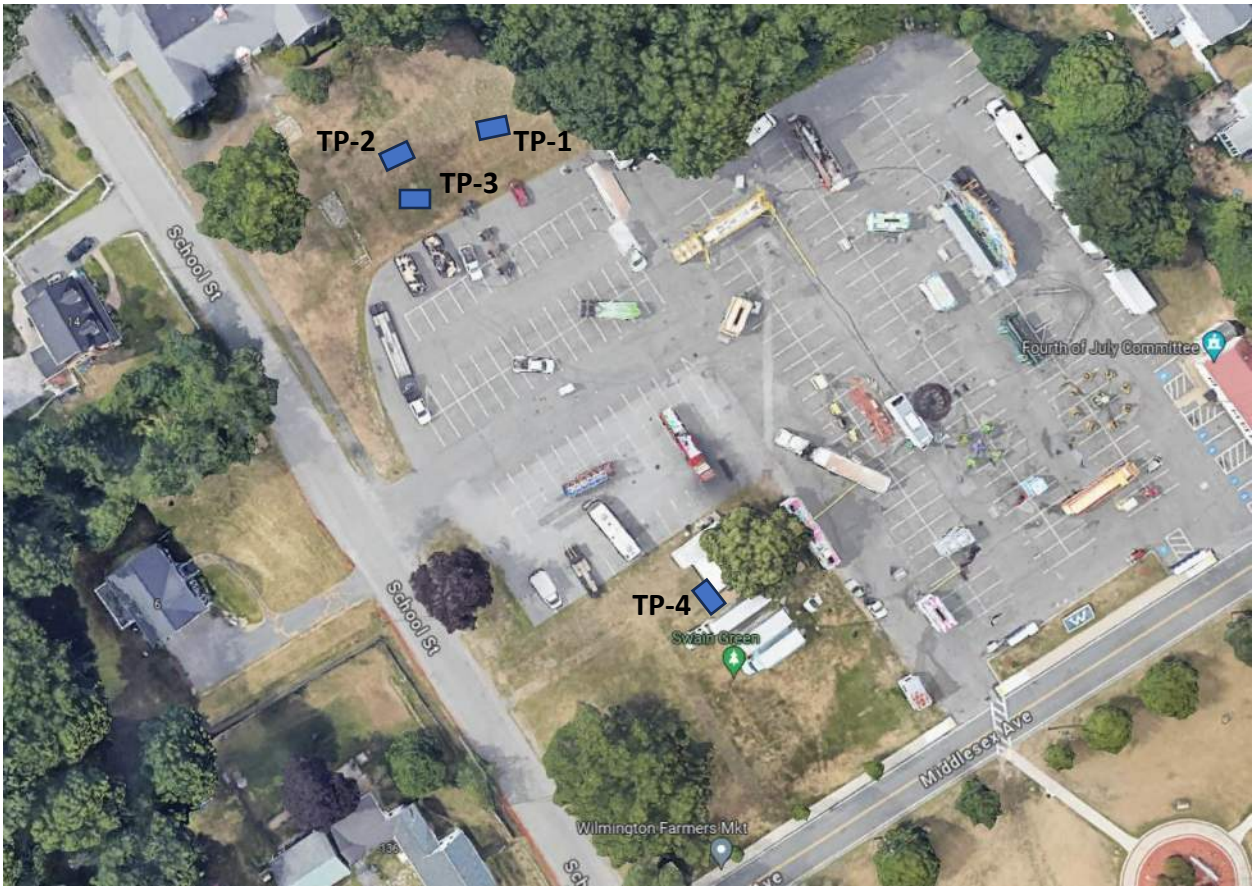
The Subject Site is currently undeveloped. The neighborhood is a mix use area of residential, town offices and public schools. As you can see from the Historic Sanborn Map (1933) shown above, the property was the location of the former Wilmington High School. The four samples were screened with a photoionization detector for total organic vapor (TOV). All screening results were Non-Detect (ND).

Historic USGS Topography Quadrangle Maps of Reading, Lowell, and Lawrence, Massachusetts were reviewed. The available USGS Maps were from 1886 through 2018 were reviewed. The topography maps show the former school building. The former high school does not show on the subject property around the 1990's. This area has never been industrial-commercial.

The soil profile in the areas excavated typically appeared to be the following:

0-8" Grass, Root Material and Loam
8"-4' Tan, Fine to Coarse Sand, Trace Silt, Some Cobbles, Some Gravel
4'-8' Orange, Fine to Medium Sand, some Cobbles, Some Boulders, Some Gravel

Samples appeared moist at 4.5'-5.0' below grade. Small pockets of coarse sand were also observed. A large boulder was observed in TP-1. No groundwater was encountered.



Sampling Plan for Test Pits (5/20/2024)

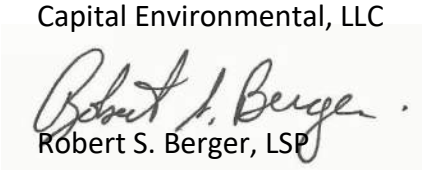
Based on the analytical testing performed, all soils in the areas sampled are considered Less Than Reporting Category RCS-1 (<RCS-1). No reportable conditions exist based on the analytical. Recycling Facilities that receive <RCS-1 materials should be able to receive these soils upon review of their environmental compliance representative.

The soils analyzed show normal natural background levels of metals. No petroleum hydrocarbons were detected. No polychlorinated biphenyls (PCBs) were detected. Only two semi-volatile organic compounds were detected in TP-3 at very low levels that can be considered anthropogenic. Only one volatile organic compound, acetone, was detected in TP-4. This was not a reportable detection. All other VOCs were non-detect.

It appears that these soils can be used or re-used on similar type properties with no concerns. Typically, receiving properties are reviewed to make sure “like soils” are brought to those properties, without introducing higher levels of chemical constituents.

Any questions can be directed to Robert S. Berger at Capital Environmental, LLC., 508 393-5550 or 508 439-2083 (cell phone).

Sincerely,
Capital Environmental, LLC



Robert S. Berger, LSP
GeoChemist/Principal

RSB/nm
Attachments

Photographs

TP-1

TP-1

TP-1

TP-2

TP-2

TP-2

TP-3

TP-3

TP-3

TP-4

New England Testing Laboratory, Inc.
(401) 353-3420

REPORT OF ANALYTICAL RESULTS

NETLAB Work Order Number: 4E21013
Client Project: 2585 - 145 Middlesex Ave, Wilmington, MA

Report Date: 31-May-2024

Prepared for:

Rob Berger
Capital Environmental
46 Washburn Street
Northborough, MA 01532

Richard Warila, Laboratory Director
New England Testing Laboratory, Inc.
59 Greenhill Street
West Warwick, RI 02893
rich.warila@newenglandtesting.com

Samples Submitted :

The samples listed below were submitted to New England Testing Laboratory on 05/21/24. The group of samples appearing in this report was assigned an internal identification number (case number) for laboratory information management purposes. The client's designations for the individual samples, along with our case numbers, are used to identify the samples in this report. This report of analytical results pertains only to the sample(s) provided to us by the client which are indicated on the custody record. The case number for this sample submission is 4E21013. Custody records are included in this report.

Lab ID	Sample	Matrix	Date Sampled	Date Received
4E21013-01	TP-1	Soil	05/20/2024	05/21/2024
4E21013-02	TP-2	Soil	05/20/2024	05/21/2024
4E21013-03	TP-3	Soil	05/20/2024	05/21/2024
4E21013-04	TP-4	Soil	05/20/2024	05/21/2024

Request for Analysis

At the client's request, the analyses presented in the following table were performed on the samples submitted.

TP-1 (Lab Number: 4E21013-01)

	Method
Antimony	EPA 6010C
Arsenic	EPA 6010C
Barium	EPA 6010C
Beryllium	EPA 6010C
Cadmium	EPA 6010C
Chromium	EPA 6010C
Flashpoint	EPA 1010A-Mod
Free liquids	EPA 9095B
Lead	EPA 6010C
Mercury	EPA 7471B
Nickel	EPA 6010C
PCBs	EPA 8082A
Percent Total Solids	Gravimetric
pH	SM4500-H-B (11)
Reactive Cyanide	NETL Internal
Reactive Sulfide	NETL Internal
Selenium	EPA 6010C
Semivolatile Organic Compounds	EPA 8270D
Silver	EPA 6010C
Specific Conductance	SM2510 - Modified
Thallium	EPA 6010C
Total Petroleum Hydrocarbons	EPA-8100-mod
Vanadium	EPA 6010C
Volatile Organic Compounds	EPA 8260C
Zinc	EPA 6010C

TP-2 (Lab Number: 4E21013-02)

	Method
Antimony	EPA 6010C
Arsenic	EPA 6010C
Barium	EPA 6010C
Beryllium	EPA 6010C
Cadmium	EPA 6010C
Chromium	EPA 6010C
Flashpoint	EPA 1010A-Mod
Free liquids	EPA 9095B
Lead	EPA 6010C
Mercury	EPA 7471B
Nickel	EPA 6010C
PCBs	EPA 8082A
Percent Total Solids	Gravimetric
pH	SM4500-H-B (11)
Reactive Cyanide	NETL Internal
Reactive Sulfide	NETL Internal
Selenium	EPA 6010C
Semivolatile Organic Compounds	EPA 8270D
Silver	EPA 6010C
Specific Conductance	SM2510 - Modified
Thallium	EPA 6010C

Request for Analysis (continued)

TP-2 (Lab Number: 4E21013-02) (continued)

	Method
Total Petroleum Hydrocarbons	EPA-8100-mod
Vanadium	EPA 6010C
Volatile Organic Compounds	EPA 8260C
Zinc	EPA 6010C

TP-3 (Lab Number: 4E21013-03)

	Method
Antimony	EPA 6010C
Arsenic	EPA 6010C
Barium	EPA 6010C
Beryllium	EPA 6010C
Cadmium	EPA 6010C
Chromium	EPA 6010C
Flashpoint	EPA 1010A-Mod
Free liquids	EPA 9095B
Lead	EPA 6010C
Mercury	EPA 7471B
Nickel	EPA 6010C
PCBs	EPA 8082A
Percent Total Solids	Gravimetric
pH	SM4500-H-B (11)
Reactive Cyanide	NETL Internal
Reactive Sulfide	NETL Internal
Selenium	EPA 6010C
Semivolatile Organic Compounds	EPA 8270D
Silver	EPA 6010C
Specific Conductance	SM2510 - Modified
Thallium	EPA 6010C
Total Petroleum Hydrocarbons	EPA-8100-mod
Vanadium	EPA 6010C
Volatile Organic Compounds	EPA 8260C
Zinc	EPA 6010C

Request for Analysis (continued)

TP-4 (Lab Number: 4E21013-04)

	Method
Antimony	EPA 6010C
Arsenic	EPA 6010C
Barium	EPA 6010C
Beryllium	EPA 6010C
Cadmium	EPA 6010C
Chromium	EPA 6010C
Flashpoint	EPA 1010A-Mod
Free liquids	EPA 9095B
Lead	EPA 6010C
Mercury	EPA 7471B
Nickel	EPA 6010C
PCBs	EPA 8082A
Percent Total Solids	Gravimetric
pH	SM4500-H-B (11)
Reactive Cyanide	NETL Internal
Reactive Sulfide	NETL Internal
Selenium	EPA 6010C
Semivolatile Organic Compounds	EPA 8270D
Silver	EPA 6010C
Specific Conductance	SM2510 - Modified
Thallium	EPA 6010C
Total Petroleum Hydrocarbons	EPA-8100-mod
Vanadium	EPA 6010C
Volatile Organic Compounds	EPA 8260C
Zinc	EPA 6010C

Method References

Reactive Cyanide, Standard Operating Procedure 407, New England Testing Laboratory Inc.

Reactive Sulfide, Standard Operating Procedure 426, New England Testing Laboratory Inc.

Standard Methods for the Examination of Water and Wastewater, 20th Edition, APHA/ AWWA-WPCF, 1998

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, USEPA

Case Narrative

Sample Receipt:

The samples associated with this work order were received in appropriately cooled and preserved containers. The chain of custody was adequately completed and corresponded to the samples submitted.

Exceptions: None

Analysis:

All samples were prepared and analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control requirements and allowances. Results for all soil samples, unless otherwise indicated, are reported on a dry weight basis.

Exceptions: None

8260: Samples "TP-1, TP-3 and TP-4" had additional stir bar vials prepared and analyzed from the bulk material provided by the client. The compound 'Actetone' was reported with concentrations estimated outside calibration, as denoted by an "E" on the report forms for sample "TP-4".

Results: General Chemistry

Sample: TP-1

Lab Number: 4E21013-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Solids, Percent	**88.5**		0.05	Percent	05/22/24	05/23/24
Flashpoint	> 200		70	degrees F	05/29/24	05/29/24
Free liquids	ABSENT			P/A	05/28/24	05/28/24
pH	**5.9**			SU	05/28/24	05/28/24
Specific Conductance	**10.1**		2.0	uS/cm	05/28/24	05/28/24

Results: General Chemistry

Sample: TP-2

Lab Number: 4E21013-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Solids, Percent	**90.3**		0.05	Percent	05/22/24	05/23/24
Flashpoint	> 200		70	degrees F	05/29/24	05/29/24
Free liquids	ABSENT			P/A	05/28/24	05/28/24
pH	**6.2**			SU	05/28/24	05/28/24
Specific Conductance	**93.6**		2.0	uS/cm	05/28/24	05/28/24

Results: General Chemistry

Sample: TP-3

Lab Number: 4E21013-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Solids, Percent	**88.7**		0.05	Percent	05/22/24	05/23/24
Flashpoint	> 200		70	degrees F	05/29/24	05/29/24
Free liquids	ABSENT			P/A	05/28/24	05/28/24
pH	**5.5**			SU	05/28/24	05/28/24
Specific Conductance	**149**		2.0	uS/cm	05/28/24	05/28/24

Results: General Chemistry

Sample: TP-4

Lab Number: 4E21013-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Solids, Percent	**93.9**		0.05	Percent	05/22/24	05/23/24
Flashpoint	> 200		70	degrees F	05/29/24	05/29/24
Free liquids	ABSENT			P/A	05/28/24	05/28/24
pH	**5.8**			SU	05/28/24	05/28/24
Specific Conductance	**7.2**		2.0	uS/cm	05/28/24	05/28/24

Results: Reactivity

Sample: TP-1

Lab Number: 4E21013-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Reactive Cyanide	ND		0.2	mg/kg	05/28/24	05/28/24
Reactive Sulfide	ND		0.1	mg/kg	05/28/24	05/28/24

Results: Reactivity

Sample: TP-2

Lab Number: 4E21013-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Reactive Cyanide	ND		0.2	mg/kg	05/28/24	05/28/24
Reactive Sulfide	ND		0.1	mg/kg	05/28/24	05/28/24

Results: Reactivity

Sample: TP-3

Lab Number: 4E21013-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Reactive Cyanide	ND		0.2	mg/kg	05/28/24	05/28/24
Reactive Sulfide	ND		0.1	mg/kg	05/28/24	05/28/24

Results: Reactivity

Sample: TP-4

Lab Number: 4E21013-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Reactive Cyanide	ND		0.2	mg/kg	05/28/24	05/28/24
Reactive Sulfide	ND		0.1	mg/kg	05/28/24	05/28/24

Results: Total Metals

Sample: TP-1

Lab Number: 4E21013-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Antimony	ND		0.84	mg/kg	05/22/24	05/24/24
Arsenic	**7.15**		1.27	mg/kg	05/22/24	05/24/24
Barium	**18.3**		0.42	mg/kg	05/22/24	05/24/24
Beryllium	ND		0.42	mg/kg	05/22/24	05/24/24
Cadmium	ND		0.63	mg/kg	05/22/24	05/24/24
Chromium	**13.4**		0.63	mg/kg	05/22/24	05/24/24
Lead	**6.71**		0.63	mg/kg	05/22/24	05/24/24
Mercury	ND		0.107	mg/kg	05/22/24	05/22/24
Nickel	**9.16**		0.63	mg/kg	05/22/24	05/24/24
Selenium	ND		1.27	mg/kg	05/22/24	05/24/24
Silver	ND		1.27	mg/kg	05/22/24	05/24/24
Vanadium	**17.0**		0.42	mg/kg	05/22/24	05/24/24
Zinc	**25.8**		2.5	mg/kg	05/22/24	05/24/24
Thallium	ND		0.42	mg/kg	05/22/24	05/24/24

Results: Total Metals

Sample: TP-2

Lab Number: 4E21013-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Antimony	ND		0.77	mg/kg	05/22/24	05/24/24
Arsenic	**7.72**		1.17	mg/kg	05/22/24	05/24/24
Barium	**18.1**		0.39	mg/kg	05/22/24	05/24/24
Beryllium	ND		0.39	mg/kg	05/22/24	05/24/24
Cadmium	ND		0.59	mg/kg	05/22/24	05/24/24
Chromium	**13.4**		0.59	mg/kg	05/22/24	05/24/24
Lead	**7.26**		0.59	mg/kg	05/22/24	05/24/24
Mercury	ND		0.096	mg/kg	05/22/24	05/22/24
Nickel	**6.94**		0.59	mg/kg	05/22/24	05/24/24
Selenium	ND		1.17	mg/kg	05/22/24	05/24/24
Silver	ND		1.17	mg/kg	05/22/24	05/24/24
Vanadium	**19.5**		0.39	mg/kg	05/22/24	05/24/24
Zinc	**24.2**		2.3	mg/kg	05/22/24	05/24/24
Thallium	ND		0.39	mg/kg	05/22/24	05/24/24

Results: Total Metals

Sample: TP-3

Lab Number: 4E21013-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Antimony	ND		0.81	mg/kg	05/22/24	05/24/24
Arsenic	**5.91**		1.22	mg/kg	05/22/24	05/24/24
Barium	**11.3**		0.40	mg/kg	05/22/24	05/24/24
Beryllium	ND		0.40	mg/kg	05/22/24	05/24/24
Cadmium	ND		0.61	mg/kg	05/22/24	05/24/24
Chromium	**8.29**		0.61	mg/kg	05/22/24	05/24/24
Lead	**4.88**		0.61	mg/kg	05/22/24	05/24/24
Mercury	ND		0.110	mg/kg	05/22/24	05/22/24
Nickel	**8.18**		0.61	mg/kg	05/22/24	05/24/24
Selenium	ND		1.22	mg/kg	05/22/24	05/24/24
Silver	ND		1.22	mg/kg	05/22/24	05/24/24
Vanadium	**8.78**		0.40	mg/kg	05/22/24	05/24/24
Zinc	**16.3**		2.4	mg/kg	05/22/24	05/24/24
Thallium	ND		0.40	mg/kg	05/22/24	05/24/24

Results: Total Metals

Sample: TP-4

Lab Number: 4E21013-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Antimony	ND		0.80	mg/kg	05/22/24	05/24/24
Arsenic	**8.22**		1.21	mg/kg	05/22/24	05/24/24
Barium	**5.62**		0.40	mg/kg	05/22/24	05/24/24
Beryllium	ND		0.40	mg/kg	05/22/24	05/24/24
Cadmium	ND		0.60	mg/kg	05/22/24	05/24/24
Chromium	**13.0**		0.60	mg/kg	05/22/24	05/24/24
Lead	**2.27**		0.60	mg/kg	05/22/24	05/24/24
Mercury	ND		0.099	mg/kg	05/22/24	05/22/24
Nickel	**8.89**		0.60	mg/kg	05/22/24	05/24/24
Selenium	ND		1.21	mg/kg	05/22/24	05/24/24
Silver	ND		1.21	mg/kg	05/22/24	05/24/24
Vanadium	**9.71**		0.40	mg/kg	05/22/24	05/24/24
Zinc	**18.9**		2.4	mg/kg	05/22/24	05/24/24
Thallium	ND		0.40	mg/kg	05/22/24	05/24/24

Results: Volatile Organic Compounds 8260C (5035-LL)

Sample: TP-1

Lab Number: 4E21013-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Acetone	ND		97	ug/kg	05/28/24	05/28/24
Benzene	ND		5	ug/kg	05/28/24	05/28/24
Bromobenzene	ND		5	ug/kg	05/28/24	05/28/24
Bromochloromethane	ND		5	ug/kg	05/28/24	05/28/24
Bromodichloromethane	ND		5	ug/kg	05/28/24	05/28/24
Bromoform	ND		5	ug/kg	05/28/24	05/28/24
Bromomethane	ND		5	ug/kg	05/28/24	05/28/24
2-Butanone	ND		97	ug/kg	05/28/24	05/28/24
tert-Butyl alcohol	ND		5	ug/kg	05/28/24	05/28/24
sec-Butylbenzene	ND		5	ug/kg	05/28/24	05/28/24
n-Butylbenzene	ND		5	ug/kg	05/28/24	05/28/24
tert-Butylbenzene	ND		5	ug/kg	05/28/24	05/28/24
Methyl t-butyl ether (MTBE)	ND		5	ug/kg	05/28/24	05/28/24
Carbon Disulfide	ND		5	ug/kg	05/28/24	05/28/24
Carbon Tetrachloride	ND		5	ug/kg	05/28/24	05/28/24
Chlorobenzene	ND		5	ug/kg	05/28/24	05/28/24
Chloroethane	ND		5	ug/kg	05/28/24	05/28/24
Chloroform	ND		5	ug/kg	05/28/24	05/28/24
Chloromethane	ND		5	ug/kg	05/28/24	05/28/24
4-Chlorotoluene	ND		5	ug/kg	05/28/24	05/28/24
2-Chlorotoluene	ND		5	ug/kg	05/28/24	05/28/24
1,2-Dibromo-3-chloropropane (DBCP)	ND		5	ug/kg	05/28/24	05/28/24
Dibromochloromethane	ND		5	ug/kg	05/28/24	05/28/24
1,2-Dibromoethane (EDB)	ND		5	ug/kg	05/28/24	05/28/24
Dibromomethane	ND		5	ug/kg	05/28/24	05/28/24
1,2-Dichlorobenzene	ND		5	ug/kg	05/28/24	05/28/24
1,3-Dichlorobenzene	ND		5	ug/kg	05/28/24	05/28/24
1,4-Dichlorobenzene	ND		5	ug/kg	05/28/24	05/28/24
1,1-Dichloroethane	ND		5	ug/kg	05/28/24	05/28/24
1,2-Dichloroethane	ND		5	ug/kg	05/28/24	05/28/24
1,2 Dichloroethene, Total	ND		5	ug/kg	05/28/24	05/28/24
trans-1,2-Dichloroethene	ND		5	ug/kg	05/28/24	05/28/24
cis-1,2-Dichloroethene	ND		5	ug/kg	05/28/24	05/28/24
1,1-Dichloroethene	ND		5	ug/kg	05/28/24	05/28/24
1,2-Dichloropropane	ND		5	ug/kg	05/28/24	05/28/24
2,2-Dichloropropane	ND		5	ug/kg	05/28/24	05/28/24
cis-1,3-Dichloropropene	ND		5	ug/kg	05/28/24	05/28/24
trans-1,3-Dichloropropene	ND		5	ug/kg	05/28/24	05/28/24
1,1-Dichloropropene	ND		5	ug/kg	05/28/24	05/28/24
1,3-Dichloropropene (cis + trans)	ND		5	ug/kg	05/28/24	05/28/24
Diethyl ether	ND		5	ug/kg	05/28/24	05/28/24
1,4-Dioxane	ND		97	ug/kg	05/28/24	05/28/24
Ethylbenzene	ND		5	ug/kg	05/28/24	05/28/24
Hexachlorobutadiene	ND		5	ug/kg	05/28/24	05/28/24
2-Hexanone	ND		97	ug/kg	05/28/24	05/28/24
Isopropylbenzene	ND		5	ug/kg	05/28/24	05/28/24
p-Isopropyltoluene	ND		5	ug/kg	05/28/24	05/28/24

Results: Volatile Organic Compounds 8260C (5035-LL) (Continued)

Sample: TP-1 (Continued)

Lab Number: 4E21013-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Methylene Chloride	ND		10	ug/kg	05/28/24	05/28/24
4-Methyl-2-pentanone	ND		97	ug/kg	05/28/24	05/28/24
Naphthalene	ND		5	ug/kg	05/28/24	05/28/24
n-Propylbenzene	ND		5	ug/kg	05/28/24	05/28/24
Styrene	ND		5	ug/kg	05/28/24	05/28/24
1,1,1,2-Tetrachloroethane	ND		5	ug/kg	05/28/24	05/28/24
Tetrachloroethene	ND		5	ug/kg	05/28/24	05/28/24
Tetrahydrofuran	ND		5	ug/kg	05/28/24	05/28/24
Toluene	ND		5	ug/kg	05/28/24	05/28/24
1,2,4-Trichlorobenzene	ND		5	ug/kg	05/28/24	05/28/24
1,2,3-Trichlorobenzene	ND		5	ug/kg	05/28/24	05/28/24
1,1,2-Trichloroethane	ND		5	ug/kg	05/28/24	05/28/24
1,1,1-Trichloroethane	ND		5	ug/kg	05/28/24	05/28/24
Trichloroethene	ND		5	ug/kg	05/28/24	05/28/24
1,2,3-Trichloropropane	ND		5	ug/kg	05/28/24	05/28/24
1,3,5-Trimethylbenzene	ND		5	ug/kg	05/28/24	05/28/24
1,2,4-Trimethylbenzene	ND		5	ug/kg	05/28/24	05/28/24
Vinyl Chloride	ND		5	ug/kg	05/28/24	05/28/24
o-Xylene	ND		5	ug/kg	05/28/24	05/28/24
m&p-Xylene	ND		10	ug/kg	05/28/24	05/28/24
Total xylenes	ND		5	ug/kg	05/28/24	05/28/24
1,1,2,2-Tetrachloroethane	ND		5	ug/kg	05/28/24	05/28/24
tert-Amyl methyl ether	ND		5	ug/kg	05/28/24	05/28/24
1,3-Dichloropropane	ND		5	ug/kg	05/28/24	05/28/24
Ethyl tert-butyl ether	ND		5	ug/kg	05/28/24	05/28/24
Diisopropyl ether	ND		5	ug/kg	05/28/24	05/28/24
Trichlorofluoromethane	ND		5	ug/kg	05/28/24	05/28/24
Dichlorodifluoromethane	ND		5	ug/kg	05/28/24	05/28/24

Surrogate(s)	Recovery%	Limits		
4-Bromofluorobenzene	*96.2%*	*70-130*	05/28/24	05/28/24
1,2-Dichloroethane-d4	*106%*	*70-130*	05/28/24	05/28/24
Toluene-d8	*100%*	*70-130*	05/28/24	05/28/24

Results: Volatile Organic Compounds 8260C (5035-LL)

Sample: TP-2

Lab Number: 4E21013-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Acetone	ND		148	ug/kg	05/22/24	05/22/24
Benzene	ND		7	ug/kg	05/22/24	05/22/24
Bromobenzene	ND		7	ug/kg	05/22/24	05/22/24
Bromochloromethane	ND		7	ug/kg	05/22/24	05/22/24
Bromodichloromethane	ND		7	ug/kg	05/22/24	05/22/24
Bromoform	ND		7	ug/kg	05/22/24	05/22/24
Bromomethane	ND		7	ug/kg	05/22/24	05/22/24
2-Butanone	ND		148	ug/kg	05/22/24	05/22/24
tert-Butyl alcohol	ND		7	ug/kg	05/22/24	05/22/24
sec-Butylbenzene	ND		7	ug/kg	05/22/24	05/22/24
n-Butylbenzene	ND		7	ug/kg	05/22/24	05/22/24
tert-Butylbenzene	ND		7	ug/kg	05/22/24	05/22/24
Methyl t-butyl ether (MTBE)	ND		7	ug/kg	05/22/24	05/22/24
Carbon Disulfide	ND		7	ug/kg	05/22/24	05/22/24
Carbon Tetrachloride	ND		7	ug/kg	05/22/24	05/22/24
Chlorobenzene	ND		7	ug/kg	05/22/24	05/22/24
Chloroethane	ND		7	ug/kg	05/22/24	05/22/24
Chloroform	ND		7	ug/kg	05/22/24	05/22/24
Chloromethane	ND		7	ug/kg	05/22/24	05/22/24
4-Chlorotoluene	ND		7	ug/kg	05/22/24	05/22/24
2-Chlorotoluene	ND		7	ug/kg	05/22/24	05/22/24
1,2-Dibromo-3-chloropropane (DBCP)	ND		7	ug/kg	05/22/24	05/22/24
Dibromochloromethane	ND		7	ug/kg	05/22/24	05/22/24
1,2-Dibromoethane (EDB)	ND		7	ug/kg	05/22/24	05/22/24
Dibromomethane	ND		7	ug/kg	05/22/24	05/22/24
1,2-Dichlorobenzene	ND		7	ug/kg	05/22/24	05/22/24
1,3-Dichlorobenzene	ND		7	ug/kg	05/22/24	05/22/24
1,4-Dichlorobenzene	ND		7	ug/kg	05/22/24	05/22/24
1,1-Dichloroethane	ND		7	ug/kg	05/22/24	05/22/24
1,2-Dichloroethane	ND		7	ug/kg	05/22/24	05/22/24
1,2 Dichloroethene, Total	ND		7	ug/kg	05/22/24	05/22/24
trans-1,2-Dichloroethene	ND		7	ug/kg	05/22/24	05/22/24
cis-1,2-Dichloroethene	ND		7	ug/kg	05/22/24	05/22/24
1,1-Dichloroethene	ND		7	ug/kg	05/22/24	05/22/24
1,2-Dichloropropane	ND		7	ug/kg	05/22/24	05/22/24
2,2-Dichloropropane	ND		7	ug/kg	05/22/24	05/22/24
cis-1,3-Dichloropropene	ND		7	ug/kg	05/22/24	05/22/24
trans-1,3-Dichloropropene	ND		7	ug/kg	05/22/24	05/22/24
1,1-Dichloropropene	ND		7	ug/kg	05/22/24	05/22/24
1,3-Dichloropropene (cis + trans)	ND		7	ug/kg	05/22/24	05/22/24
Diethyl ether	ND		7	ug/kg	05/22/24	05/22/24
1,4-Dioxane	ND		148	ug/kg	05/22/24	05/22/24
Ethylbenzene	ND		7	ug/kg	05/22/24	05/22/24
Hexachlorobutadiene	ND		7	ug/kg	05/22/24	05/22/24
2-Hexanone	ND		148	ug/kg	05/22/24	05/22/24
Isopropylbenzene	ND		7	ug/kg	05/22/24	05/22/24
p-Isopropyltoluene	ND		7	ug/kg	05/22/24	05/22/24

Results: Volatile Organic Compounds 8260C (5035-LL) (Continued)

Sample: TP-2 (Continued)

Lab Number: 4E21013-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Methylene Chloride	ND		7	ug/kg	05/22/24	05/22/24
4-Methyl-2-pentanone	ND		148	ug/kg	05/22/24	05/22/24
Naphthalene	ND		7	ug/kg	05/22/24	05/22/24
n-Propylbenzene	ND		7	ug/kg	05/22/24	05/22/24
Styrene	ND		7	ug/kg	05/22/24	05/22/24
1,1,1,2-Tetrachloroethane	ND		7	ug/kg	05/22/24	05/22/24
Tetrachloroethene	ND		7	ug/kg	05/22/24	05/22/24
Tetrahydrofuran	ND		7	ug/kg	05/22/24	05/22/24
Toluene	ND		7	ug/kg	05/22/24	05/22/24
1,2,4-Trichlorobenzene	ND		7	ug/kg	05/22/24	05/22/24
1,2,3-Trichlorobenzene	ND		7	ug/kg	05/22/24	05/22/24
1,1,2-Trichloroethane	ND		7	ug/kg	05/22/24	05/22/24
1,1,1-Trichloroethane	ND		7	ug/kg	05/22/24	05/22/24
Trichloroethene	ND		7	ug/kg	05/22/24	05/22/24
1,2,3-Trichloropropane	ND		7	ug/kg	05/22/24	05/22/24
1,3,5-Trimethylbenzene	ND		7	ug/kg	05/22/24	05/22/24
1,2,4-Trimethylbenzene	ND		7	ug/kg	05/22/24	05/22/24
Vinyl Chloride	ND		7	ug/kg	05/22/24	05/22/24
o-Xylene	ND		7	ug/kg	05/22/24	05/22/24
m&p-Xylene	ND		15	ug/kg	05/22/24	05/22/24
Total xylenes	ND		7	ug/kg	05/22/24	05/22/24
1,1,2,2-Tetrachloroethane	ND		7	ug/kg	05/22/24	05/22/24
tert-Amyl methyl ether	ND		7	ug/kg	05/22/24	05/22/24
1,3-Dichloropropane	ND		7	ug/kg	05/22/24	05/22/24
Ethyl tert-butyl ether	ND		7	ug/kg	05/22/24	05/22/24
Diisopropyl ether	ND		7	ug/kg	05/22/24	05/22/24
Trichlorofluoromethane	ND		7	ug/kg	05/22/24	05/22/24
Dichlorodifluoromethane	ND		7	ug/kg	05/22/24	05/22/24

Surrogate(s)	Recovery%	Limits		
4-Bromofluorobenzene	*92.0%*	*70-130*	05/22/24	05/22/24
1,2-Dichloroethane-d4	*107%*	*70-130*	05/22/24	05/22/24
Toluene-d8	*94.2%*	*70-130*	05/22/24	05/22/24

Results: Volatile Organic Compounds 8260C (5035-LL)

Sample: TP-3

Lab Number: 4E21013-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Acetone	ND		79	ug/kg	05/28/24	05/28/24
Benzene	ND		4	ug/kg	05/28/24	05/28/24
Bromobenzene	ND		4	ug/kg	05/28/24	05/28/24
Bromochloromethane	ND		4	ug/kg	05/28/24	05/28/24
Bromodichloromethane	ND		4	ug/kg	05/28/24	05/28/24
Bromoform	ND		4	ug/kg	05/28/24	05/28/24
Bromomethane	ND		4	ug/kg	05/28/24	05/28/24
2-Butanone	ND		79	ug/kg	05/28/24	05/28/24
tert-Butyl alcohol	ND		4	ug/kg	05/28/24	05/28/24
sec-Butylbenzene	ND		4	ug/kg	05/28/24	05/28/24
n-Butylbenzene	ND		4	ug/kg	05/28/24	05/28/24
tert-Butylbenzene	ND		4	ug/kg	05/28/24	05/28/24
Methyl t-butyl ether (MTBE)	ND		4	ug/kg	05/28/24	05/28/24
Carbon Disulfide	ND		4	ug/kg	05/28/24	05/28/24
Carbon Tetrachloride	ND		4	ug/kg	05/28/24	05/28/24
Chlorobenzene	ND		4	ug/kg	05/28/24	05/28/24
Chloroethane	ND		4	ug/kg	05/28/24	05/28/24
Chloroform	ND		4	ug/kg	05/28/24	05/28/24
Chloromethane	ND		4	ug/kg	05/28/24	05/28/24
4-Chlorotoluene	ND		4	ug/kg	05/28/24	05/28/24
2-Chlorotoluene	ND		4	ug/kg	05/28/24	05/28/24
1,2-Dibromo-3-chloropropane (DBCP)	ND		4	ug/kg	05/28/24	05/28/24
Dibromochloromethane	ND		4	ug/kg	05/28/24	05/28/24
1,2-Dibromoethane (EDB)	ND		4	ug/kg	05/28/24	05/28/24
Dibromomethane	ND		4	ug/kg	05/28/24	05/28/24
1,2-Dichlorobenzene	ND		4	ug/kg	05/28/24	05/28/24
1,3-Dichlorobenzene	ND		4	ug/kg	05/28/24	05/28/24
1,4-Dichlorobenzene	ND		4	ug/kg	05/28/24	05/28/24
1,1-Dichloroethane	ND		4	ug/kg	05/28/24	05/28/24
1,2-Dichloroethane	ND		4	ug/kg	05/28/24	05/28/24
1,2 Dichloroethene, Total	ND		4	ug/kg	05/28/24	05/28/24
trans-1,2-Dichloroethene	ND		4	ug/kg	05/28/24	05/28/24
cis-1,2-Dichloroethene	ND		4	ug/kg	05/28/24	05/28/24
1,1-Dichloroethene	ND		4	ug/kg	05/28/24	05/28/24
1,2-Dichloropropane	ND		4	ug/kg	05/28/24	05/28/24
2,2-Dichloropropane	ND		4	ug/kg	05/28/24	05/28/24
cis-1,3-Dichloropropene	ND		4	ug/kg	05/28/24	05/28/24
trans-1,3-Dichloropropene	ND		4	ug/kg	05/28/24	05/28/24
1,1-Dichloropropene	ND		4	ug/kg	05/28/24	05/28/24
1,3-Dichloropropene (cis + trans)	ND		4	ug/kg	05/28/24	05/28/24
Diethyl ether	ND		4	ug/kg	05/28/24	05/28/24
1,4-Dioxane	ND		79	ug/kg	05/28/24	05/28/24
Ethylbenzene	ND		4	ug/kg	05/28/24	05/28/24
Hexachlorobutadiene	ND		4	ug/kg	05/28/24	05/28/24
2-Hexanone	ND		79	ug/kg	05/28/24	05/28/24
Isopropylbenzene	ND		4	ug/kg	05/28/24	05/28/24
p-Isopropyltoluene	ND		4	ug/kg	05/28/24	05/28/24

Results: Volatile Organic Compounds 8260C (5035-LL) (Continued)

Sample: TP-3 (Continued)

Lab Number: 4E21013-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Methylene Chloride	ND		12	ug/kg	05/28/24	05/28/24
4-Methyl-2-pentanone	ND		79	ug/kg	05/28/24	05/28/24
Naphthalene	ND		4	ug/kg	05/28/24	05/28/24
n-Propylbenzene	ND		4	ug/kg	05/28/24	05/28/24
Styrene	ND		4	ug/kg	05/28/24	05/28/24
1,1,1,2-Tetrachloroethane	ND		4	ug/kg	05/28/24	05/28/24
Tetrachloroethene	ND		4	ug/kg	05/28/24	05/28/24
Tetrahydrofuran	ND		4	ug/kg	05/28/24	05/28/24
Toluene	ND		4	ug/kg	05/28/24	05/28/24
1,2,4-Trichlorobenzene	ND		4	ug/kg	05/28/24	05/28/24
1,2,3-Trichlorobenzene	ND		4	ug/kg	05/28/24	05/28/24
1,1,2-Trichloroethane	ND		4	ug/kg	05/28/24	05/28/24
1,1,1-Trichloroethane	ND		4	ug/kg	05/28/24	05/28/24
Trichloroethene	ND		4	ug/kg	05/28/24	05/28/24
1,2,3-Trichloropropane	ND		4	ug/kg	05/28/24	05/28/24
1,3,5-Trimethylbenzene	ND		4	ug/kg	05/28/24	05/28/24
1,2,4-Trimethylbenzene	ND		4	ug/kg	05/28/24	05/28/24
Vinyl Chloride	ND		4	ug/kg	05/28/24	05/28/24
o-Xylene	ND		4	ug/kg	05/28/24	05/28/24
m&p-Xylene	ND		8	ug/kg	05/28/24	05/28/24
Total xylenes	ND		4	ug/kg	05/28/24	05/28/24
1,1,2,2-Tetrachloroethane	ND		4	ug/kg	05/28/24	05/28/24
tert-Amyl methyl ether	ND		4	ug/kg	05/28/24	05/28/24
1,3-Dichloropropane	ND		4	ug/kg	05/28/24	05/28/24
Ethyl tert-butyl ether	ND		4	ug/kg	05/28/24	05/28/24
Diisopropyl ether	ND		4	ug/kg	05/28/24	05/28/24
Trichlorofluoromethane	ND		4	ug/kg	05/28/24	05/28/24
Dichlorodifluoromethane	ND		4	ug/kg	05/28/24	05/28/24

Surrogate(s)	Recovery%	Limits		
4-Bromofluorobenzene	*97.4%*	*70-130*	05/28/24	05/28/24
1,2-Dichloroethane-d4	*103%*	*70-130*	05/28/24	05/28/24
Toluene-d8	*100%*	*70-130*	05/28/24	05/28/24

Results: Volatile Organic Compounds 8260C (5035-LL)

Sample: TP-4

Lab Number: 4E21013-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Acetone	**568**	E	85	ug/kg	05/28/24	05/31/24
Benzene	ND		4	ug/kg	05/28/24	05/28/24
Bromobenzene	ND		4	ug/kg	05/28/24	05/28/24
Bromochloromethane	ND		4	ug/kg	05/28/24	05/28/24
Bromodichloromethane	ND		4	ug/kg	05/28/24	05/28/24
Bromoform	ND		4	ug/kg	05/28/24	05/28/24
Bromomethane	ND		4	ug/kg	05/28/24	05/28/24
2-Butanone	ND		85	ug/kg	05/28/24	05/28/24
tert-Butyl alcohol	ND		4	ug/kg	05/28/24	05/28/24
sec-Butylbenzene	ND		4	ug/kg	05/28/24	05/28/24
n-Butylbenzene	ND		4	ug/kg	05/28/24	05/28/24
tert-Butylbenzene	ND		4	ug/kg	05/28/24	05/28/24
Methyl t-butyl ether (MTBE)	ND		4	ug/kg	05/28/24	05/28/24
Carbon Disulfide	ND		4	ug/kg	05/28/24	05/28/24
Carbon Tetrachloride	ND		4	ug/kg	05/28/24	05/28/24
Chlorobenzene	ND		4	ug/kg	05/28/24	05/28/24
Chloroethane	ND		4	ug/kg	05/28/24	05/28/24
Chloroform	ND		4	ug/kg	05/28/24	05/28/24
Chloromethane	ND		4	ug/kg	05/28/24	05/28/24
4-Chlorotoluene	ND		4	ug/kg	05/28/24	05/28/24
2-Chlorotoluene	ND		4	ug/kg	05/28/24	05/28/24
1,2-Dibromo-3-chloropropane (DBCP)	ND		4	ug/kg	05/28/24	05/28/24
Dibromochloromethane	ND		4	ug/kg	05/28/24	05/28/24
1,2-Dibromoethane (EDB)	ND		4	ug/kg	05/28/24	05/28/24
Dibromomethane	ND		4	ug/kg	05/28/24	05/28/24
1,2-Dichlorobenzene	ND		4	ug/kg	05/28/24	05/28/24
1,3-Dichlorobenzene	ND		4	ug/kg	05/28/24	05/28/24
1,4-Dichlorobenzene	ND		4	ug/kg	05/28/24	05/28/24
1,1-Dichloroethane	ND		4	ug/kg	05/28/24	05/28/24
1,2-Dichloroethane	ND		4	ug/kg	05/28/24	05/28/24
1,2 Dichloroethene, Total	ND		4	ug/kg	05/28/24	05/28/24
trans-1,2-Dichloroethene	ND		4	ug/kg	05/28/24	05/28/24
cis-1,2-Dichloroethene	ND		4	ug/kg	05/28/24	05/28/24
1,1-Dichloroethene	ND		4	ug/kg	05/28/24	05/28/24
1,2-Dichloropropane	ND		4	ug/kg	05/28/24	05/28/24
2,2-Dichloropropane	ND		4	ug/kg	05/28/24	05/28/24
cis-1,3-Dichloropropene	ND		4	ug/kg	05/28/24	05/28/24
trans-1,3-Dichloropropene	ND		4	ug/kg	05/28/24	05/28/24
1,1-Dichloropropene	ND		4	ug/kg	05/28/24	05/28/24
1,3-Dichloropropene (cis + trans)	ND		4	ug/kg	05/28/24	05/28/24
Diethyl ether	ND		4	ug/kg	05/28/24	05/28/24
1,4-Dioxane	ND		85	ug/kg	05/28/24	05/28/24
Ethylbenzene	ND		4	ug/kg	05/28/24	05/28/24
Hexachlorobutadiene	ND		4	ug/kg	05/28/24	05/28/24
2-Hexanone	ND		85	ug/kg	05/28/24	05/28/24
Isopropylbenzene	ND		4	ug/kg	05/28/24	05/28/24
p-Isopropyltoluene	ND		4	ug/kg	05/28/24	05/28

Results: Volatile Organic Compounds 8260C (5035-LL) (Continued)

Sample: TP-4 (Continued)

Lab Number: 4E21013-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Methylene Chloride	ND		4	ug/kg	05/28/24	05/28/24
4-Methyl-2-pentanone	ND		85	ug/kg	05/28/24	05/28/24
Naphthalene	ND		4	ug/kg	05/28/24	05/28/24
n-Propylbenzene	ND		4	ug/kg	05/28/24	05/28/24
Styrene	ND		4	ug/kg	05/28/24	05/28/24
1,1,1,2-Tetrachloroethane	ND		4	ug/kg	05/28/24	05/28/24
Tetrachloroethene	ND		4	ug/kg	05/28/24	05/28/24
Tetrahydrofuran	ND		4	ug/kg	05/28/24	05/28/24
Toluene	ND		4	ug/kg	05/28/24	05/28/24
1,2,4-Trichlorobenzene	ND		4	ug/kg	05/28/24	05/28/24
1,2,3-Trichlorobenzene	ND		4	ug/kg	05/28/24	05/28/24
1,1,2-Trichloroethane	ND		4	ug/kg	05/28/24	05/28/24
1,1,1-Trichloroethane	ND		4	ug/kg	05/28/24	05/28/24
Trichloroethene	ND		4	ug/kg	05/28/24	05/28/24
1,2,3-Trichloropropane	ND		4	ug/kg	05/28/24	05/28/24
1,3,5-Trimethylbenzene	ND		4	ug/kg	05/28/24	05/28/24
1,2,4-Trimethylbenzene	ND		4	ug/kg	05/28/24	05/28/24
Vinyl Chloride	ND		4	ug/kg	05/28/24	05/28/24
o-Xylene	ND		4	ug/kg	05/28/24	05/28/24
m&p-Xylene	ND		8	ug/kg	05/28/24	05/28/24
Total xylenes	ND		4	ug/kg	05/28/24	05/28/24
1,1,2,2-Tetrachloroethane	ND		4	ug/kg	05/28/24	05/28/24
tert-Amyl methyl ether	ND		4	ug/kg	05/28/24	05/28/24
1,3-Dichloropropane	ND		4	ug/kg	05/28/24	05/28/24
Ethyl tert-butyl ether	ND		4	ug/kg	05/28/24	05/28/24
Diisopropyl ether	ND		4	ug/kg	05/28/24	05/28/24
Trichlorofluoromethane	ND		4	ug/kg	05/28/24	05/28/24
Dichlorodifluoromethane	ND		4	ug/kg	05/28/24	05/28/24

Surrogate(s)	Recovery%	Limits		
4-Bromofluorobenzene	*98.5%*	*70-130*	05/28/24	05/28/24
1,2-Dichloroethane-d4	*104%*	*70-130*	05/28/24	05/28/24
Toluene-d8	*101%*	*70-130*	05/28/24	05/28/24

Results: Semivolatile organic compounds

Sample: TP-1

Lab Number: 4E21013-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
1,2,4-Trichlorobenzene	ND		146	ug/kg	05/23/24	05/24/24
1,2-Dichlorobenzene	ND		146	ug/kg	05/23/24	05/24/24
1,3-Dichlorobenzene	ND		146	ug/kg	05/23/24	05/24/24
1,4-Dichlorobenzene	ND		146	ug/kg	05/23/24	05/24/24
Phenol	ND		146	ug/kg	05/23/24	05/24/24
2,4,5-Trichlorophenol	ND		146	ug/kg	05/23/24	05/24/24
2,4,6-Trichlorophenol	ND		146	ug/kg	05/23/24	05/24/24
2,4-Dichlorophenol	ND		146	ug/kg	05/23/24	05/24/24
2,4-Dimethylphenol	ND		371	ug/kg	05/23/24	05/24/24
2,4-Dinitrophenol	ND		371	ug/kg	05/23/24	05/24/24
2,4-Dinitrotoluene	ND		146	ug/kg	05/23/24	05/24/24
2,6-Dinitrotoluene	ND		146	ug/kg	05/23/24	05/24/24
2-Chloronaphthalene	ND		146	ug/kg	05/23/24	05/24/24
2-Chlorophenol	ND		146	ug/kg	05/23/24	05/24/24
2-Methylnaphthalene	ND		146	ug/kg	05/23/24	05/24/24
Nitrobenzene	ND		146	ug/kg	05/23/24	05/24/24
2-Methylphenol	ND		146	ug/kg	05/23/24	05/24/24
2-Nitroaniline	ND		146	ug/kg	05/23/24	05/24/24
2-Nitrophenol	ND		371	ug/kg	05/23/24	05/24/24
3,3'-Dichlorobenzidine	ND		371	ug/kg	05/23/24	05/24/24
3-Nitroaniline	ND		146	ug/kg	05/23/24	05/24/24
4,6-Dinitro-2-methylphenol	ND		371	ug/kg	05/23/24	05/24/24
4-Bromophenyl phenyl ether	ND		146	ug/kg	05/23/24	05/24/24
4-Chloro-3-methylphenol	ND		146	ug/kg	05/23/24	05/24/24
4-Chloroaniline	ND		146	ug/kg	05/23/24	05/24/24
4-Chlorophenyl phenyl ether	ND		146	ug/kg	05/23/24	05/24/24
4-Nitroaniline	ND		146	ug/kg	05/23/24	05/24/24
4-Nitrophenol	ND		371	ug/kg	05/23/24	05/24/24
Acenaphthene	ND		146	ug/kg	05/23/24	05/24/24
Acenaphthylene	ND		146	ug/kg	05/23/24	05/24/24
Aniline	ND		146	ug/kg	05/23/24	05/24/24
Anthracene	ND		146	ug/kg	05/23/24	05/24/24
Benzo(a)anthracene	ND		146	ug/kg	05/23/24	05/24/24
Benzo(a)pyrene	ND		146	ug/kg	05/23/24	05/24/24
Benzo(b)fluoranthene	ND		146	ug/kg	05/23/24	05/24/24
Benzo(g,h,i)perylene	ND		146	ug/kg	05/23/24	05/24/24
Benzo(k)fluoranthene	ND		146	ug/kg	05/23/24	05/24/24
Benzoic acid	ND		1120	ug/kg	05/23/24	05/24/24
Biphenyl	ND		22	ug/kg	05/23/24	05/24/24
Bis(2-chloroethoxy)methane	ND		146	ug/kg	05/23/24	05/24/24
Bis(2-chloroethyl)ether	ND		146	ug/kg	05/23/24	05/24/24
Bis(2-chloroisopropyl)ether	ND		146	ug/kg	05/23/24	05/24/24
Bis(2-ethylhexyl)phthalate	ND		449	ug/kg	05/23/24	05/24/24
Butyl benzyl phthalate	ND		146	ug/kg	05/23/24	05/24/24
Chrysene	ND		146	ug/kg	05/23/24	05/24/24
Di-n-octyl phthalate	ND		225	ug/kg	05/23/24	05/24/24
Dibenz(a,h)anthracene	ND		146	ug/kg	05/23/24	05/24/24

Results: Semivolatile organic compounds (Continued)

Sample: TP-1 (Continued)

Lab Number: 4E21013-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Dibenzofuran	ND		146	ug/kg	05/23/24	05/24/24
Diethyl phthalate	ND		146	ug/kg	05/23/24	05/24/24
Dimethyl phthalate	ND		371	ug/kg	05/23/24	05/24/24
Di-n-butyl phthalate	ND		225	ug/kg	05/23/24	05/24/24
Fluoranthene	ND		146	ug/kg	05/23/24	05/24/24
Fluorene	ND		146	ug/kg	05/23/24	05/24/24
Hexachlorobenzene	ND		146	ug/kg	05/23/24	05/24/24
Hexachlorobutadiene	ND		146	ug/kg	05/23/24	05/24/24
Hexachlorocyclopentadiene	ND		371	ug/kg	05/23/24	05/24/24
Hexachloroethane	ND		146	ug/kg	05/23/24	05/24/24
Indeno(1,2,3-cd)pyrene	ND		146	ug/kg	05/23/24	05/24/24
Isophorone	ND		146	ug/kg	05/23/24	05/24/24
Naphthalene	ND		146	ug/kg	05/23/24	05/24/24
N-Nitrosodimethylamine	ND		146	ug/kg	05/23/24	05/24/24
N-Nitrosodi-n-propylamine	ND		146	ug/kg	05/23/24	05/24/24
N-Nitrosodiphenylamine	ND		146	ug/kg	05/23/24	05/24/24
Pentachlorophenol	ND		371	ug/kg	05/23/24	05/24/24
Phenanthrene	ND		146	ug/kg	05/23/24	05/24/24
Pyrene	ND		146	ug/kg	05/23/24	05/24/24
m&p-Cresol	ND		292	ug/kg	05/23/24	05/24/24
Pyridine	ND		146	ug/kg	05/23/24	05/24/24
Azobenzene	ND		146	ug/kg	05/23/24	05/24/24
Total Dichlorobenzene	ND		146	ug/kg	05/23/24	05/24/24

Surrogate(s)	Recovery%	Limits		
Nitrobenzene-d5	*51.6%*	*30-126*	05/23/24	05/24/24
p-Terphenyl-d14	*93.1%*	*47-130*	05/23/24	05/24/24
2-Fluorobiphenyl	*64.1%*	*34-130*	05/23/24	05/24/24
Phenol-d6	*44.5%*	*30-130*	05/23/24	05/24/24
2,4,6-Tribromophenol	*65.2%*	*30-130*	05/23/24	05/24/24
2-Fluorophenol	*43.8%*	*30-130*	05/23/24	05/24/24

Results: Semivolatile organic compounds

Sample: TP-2

Lab Number: 4E21013-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
1,2,4-Trichlorobenzene	ND		143	ug/kg	05/23/24	05/24/24
1,2-Dichlorobenzene	ND		143	ug/kg	05/23/24	05/24/24
1,3-Dichlorobenzene	ND		143	ug/kg	05/23/24	05/24/24
1,4-Dichlorobenzene	ND		143	ug/kg	05/23/24	05/24/24
Phenol	ND		143	ug/kg	05/23/24	05/24/24
2,4,5-Trichlorophenol	ND		143	ug/kg	05/23/24	05/24/24
2,4,6-Trichlorophenol	ND		143	ug/kg	05/23/24	05/24/24
2,4-Dichlorophenol	ND		143	ug/kg	05/23/24	05/24/24
2,4-Dimethylphenol	ND		363	ug/kg	05/23/24	05/24/24
2,4-Dinitrophenol	ND		363	ug/kg	05/23/24	05/24/24
2,4-Dinitrotoluene	ND		143	ug/kg	05/23/24	05/24/24
2,6-Dinitrotoluene	ND		143	ug/kg	05/23/24	05/24/24
2-Chloronaphthalene	ND		143	ug/kg	05/23/24	05/24/24
2-Chlorophenol	ND		143	ug/kg	05/23/24	05/24/24
2-Methylnaphthalene	ND		143	ug/kg	05/23/24	05/24/24
Nitrobenzene	ND		143	ug/kg	05/23/24	05/24/24
2-Methylphenol	ND		143	ug/kg	05/23/24	05/24/24
2-Nitroaniline	ND		143	ug/kg	05/23/24	05/24/24
2-Nitrophenol	ND		363	ug/kg	05/23/24	05/24/24
3,3'-Dichlorobenzidine	ND		363	ug/kg	05/23/24	05/24/24
3-Nitroaniline	ND		143	ug/kg	05/23/24	05/24/24
4,6-Dinitro-2-methylphenol	ND		363	ug/kg	05/23/24	05/24/24
4-Bromophenyl phenyl ether	ND		143	ug/kg	05/23/24	05/24/24
4-Chloro-3-methylphenol	ND		143	ug/kg	05/23/24	05/24/24
4-Chloroaniline	ND		143	ug/kg	05/23/24	05/24/24
4-Chlorophenyl phenyl ether	ND		143	ug/kg	05/23/24	05/24/24
4-Nitroaniline	ND		143	ug/kg	05/23/24	05/24/24
4-Nitrophenol	ND		363	ug/kg	05/23/24	05/24/24
Acenaphthene	ND		143	ug/kg	05/23/24	05/24/24
Acenaphthylene	ND		143	ug/kg	05/23/24	05/24/24
Aniline	ND		143	ug/kg	05/23/24	05/24/24
Anthracene	ND		143	ug/kg	05/23/24	05/24/24
Benzo(a)anthracene	ND		143	ug/kg	05/23/24	05/24/24
Benzo(a)pyrene	ND		143	ug/kg	05/23/24	05/24/24
Benzo(b)fluoranthene	ND		143	ug/kg	05/23/24	05/24/24
Benzo(g,h,i)perylene	ND		143	ug/kg	05/23/24	05/24/24
Benzo(k)fluoranthene	ND		143	ug/kg	05/23/24	05/24/24
Benzoic acid	ND		1100	ug/kg	05/23/24	05/24/24
Biphenyl	ND		22	ug/kg	05/23/24	05/24/24
Bis(2-chloroethoxy)methane	ND		143	ug/kg	05/23/24	05/24/24
Bis(2-chloroethyl)ether	ND		143	ug/kg	05/23/24	05/24/24
Bis(2-chloroisopropyl)ether	ND		143	ug/kg	05/23/24	05/24/24
Bis(2-ethylhexyl)phthalate	ND		440	ug/kg	05/23/24	05/24/24
Butyl benzyl phthalate	ND		143	ug/kg	05/23/24	05/24/24
Chrysene	ND		143	ug/kg	05/23/24	05/24/24
Di-n-octyl phthalate	ND		220	ug/kg	05/23/24	05/24/24
Dibenz(a,h)anthracene	ND		143	ug/kg	05/23/24	05/24/24

Results: Semivolatile organic compounds (Continued)

Sample: TP-2 (Continued)

Lab Number: 4E21013-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Dibenzofuran	ND		143	ug/kg	05/23/24	05/24/24
Diethyl phthalate	ND		143	ug/kg	05/23/24	05/24/24
Dimethyl phthalate	ND		363	ug/kg	05/23/24	05/24/24
Di-n-butyl phthalate	ND		220	ug/kg	05/23/24	05/24/24
Fluoranthene	ND		143	ug/kg	05/23/24	05/24/24
Fluorene	ND		143	ug/kg	05/23/24	05/24/24
Hexachlorobenzene	ND		143	ug/kg	05/23/24	05/24/24
Hexachlorobutadiene	ND		143	ug/kg	05/23/24	05/24/24
Hexachlorocyclopentadiene	ND		363	ug/kg	05/23/24	05/24/24
Hexachloroethane	ND		143	ug/kg	05/23/24	05/24/24
Indeno(1,2,3-cd)pyrene	ND		143	ug/kg	05/23/24	05/24/24
Isophorone	ND		143	ug/kg	05/23/24	05/24/24
Naphthalene	ND		143	ug/kg	05/23/24	05/24/24
N-Nitrosodimethylamine	ND		143	ug/kg	05/23/24	05/24/24
N-Nitrosodi-n-propylamine	ND		143	ug/kg	05/23/24	05/24/24
N-Nitrosodiphenylamine	ND		143	ug/kg	05/23/24	05/24/24
Pentachlorophenol	ND		363	ug/kg	05/23/24	05/24/24
Phenanthrene	ND		143	ug/kg	05/23/24	05/24/24
Pyrene	ND		143	ug/kg	05/23/24	05/24/24
m&p-Cresol	ND		286	ug/kg	05/23/24	05/24/24
Pyridine	ND		143	ug/kg	05/23/24	05/24/24
Azobenzene	ND		143	ug/kg	05/23/24	05/24/24
Total Dichlorobenzene	ND		143	ug/kg	05/23/24	05/24/24

Surrogate(s)	Recovery%	Limits		
Nitrobenzene-d5	*37.8%*	*30-126*	05/23/24	05/24/24
p-Terphenyl-d14	*68.7%*	*47-130*	05/23/24	05/24/24
2-Fluorobiphenyl	*44.1%*	*34-130*	05/23/24	05/24/24
Phenol-d6	*30.8%*	*30-130*	05/23/24	05/24/24
2,4,6-Tribromophenol	*39.8%*	*30-130*	05/23/24	05/24/24
2-Fluorophenol	*32.3%*	*30-130*	05/23/24	05/24/24

Results: Semivolatile organic compounds

Sample: TP-3

Lab Number: 4E21013-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
1,2,4-Trichlorobenzene	ND		146	ug/kg	05/23/24	05/24/24
1,2-Dichlorobenzene	ND		146	ug/kg	05/23/24	05/24/24
1,3-Dichlorobenzene	ND		146	ug/kg	05/23/24	05/24/24
1,4-Dichlorobenzene	ND		146	ug/kg	05/23/24	05/24/24
Phenol	ND		146	ug/kg	05/23/24	05/24/24
2,4,5-Trichlorophenol	ND		146	ug/kg	05/23/24	05/24/24
2,4,6-Trichlorophenol	ND		146	ug/kg	05/23/24	05/24/24
2,4-Dichlorophenol	ND		146	ug/kg	05/23/24	05/24/24
2,4-Dimethylphenol	ND		369	ug/kg	05/23/24	05/24/24
2,4-Dinitrophenol	ND		369	ug/kg	05/23/24	05/24/24
2,4-Dinitrotoluene	ND		146	ug/kg	05/23/24	05/24/24
2,6-Dinitrotoluene	ND		146	ug/kg	05/23/24	05/24/24
2-Chloronaphthalene	ND		146	ug/kg	05/23/24	05/24/24
2-Chlorophenol	ND		146	ug/kg	05/23/24	05/24/24
2-Methylnaphthalene	ND		146	ug/kg	05/23/24	05/24/24
Nitrobenzene	ND		146	ug/kg	05/23/24	05/24/24
2-Methylphenol	ND		146	ug/kg	05/23/24	05/24/24
2-Nitroaniline	ND		146	ug/kg	05/23/24	05/24/24
2-Nitrophenol	ND		369	ug/kg	05/23/24	05/24/24
3,3'-Dichlorobenzidine	ND		369	ug/kg	05/23/24	05/24/24
3-Nitroaniline	ND		146	ug/kg	05/23/24	05/24/24
4,6-Dinitro-2-methylphenol	ND		369	ug/kg	05/23/24	05/24/24
4-Bromophenyl phenyl ether	ND		146	ug/kg	05/23/24	05/24/24
4-Chloro-3-methylphenol	ND		146	ug/kg	05/23/24	05/24/24
4-Chloroaniline	ND		146	ug/kg	05/23/24	05/24/24
4-Chlorophenyl phenyl ether	ND		146	ug/kg	05/23/24	05/24/24
4-Nitroaniline	ND		146	ug/kg	05/23/24	05/24/24
4-Nitrophenol	ND		369	ug/kg	05/23/24	05/24/24
Acenaphthene	ND		146	ug/kg	05/23/24	05/24/24
Acenaphthylene	ND		146	ug/kg	05/23/24	05/24/24
Aniline	ND		146	ug/kg	05/23/24	05/24/24
Anthracene	ND		146	ug/kg	05/23/24	05/24/24
Benzo(a)anthracene	ND		146	ug/kg	05/23/24	05/24/24
Benzo(a)pyrene	ND		146	ug/kg	05/23/24	05/24/24
Benzo(b)fluoranthene	ND		146	ug/kg	05/23/24	05/24/24
Benzo(g,h,i)perylene	ND		146	ug/kg	05/23/24	05/24/24
Benzo(k)fluoranthene	ND		146	ug/kg	05/23/24	05/24/24
Benzoic acid	ND		1120	ug/kg	05/23/24	05/24/24
Biphenyl	ND		22	ug/kg	05/23/24	05/24/24
Bis(2-chloroethoxy)methane	ND		146	ug/kg	05/23/24	05/24/24
Bis(2-chloroethyl)ether	ND		146	ug/kg	05/23/24	05/24/24
Bis(2-chloroisopropyl)ether	ND		146	ug/kg	05/23/24	05/24/24
Bis(2-ethylhexyl)phthalate	ND		448	ug/kg	05/23/24	05/24/24
Butyl benzyl phthalate	ND		146	ug/kg	05/23/24	05/24/24
Chrysene	ND		146	ug/kg	05/23/24	05/24/24
Di-n-octyl phthalate	ND		224	ug/kg	05/23/24	05/24/24
Dibenz(a,h)anthracene	ND		146	ug/kg	05/23/24	05/24

Results: Semivolatile organic compounds (Continued)

Sample: TP-3 (Continued)

Lab Number: 4E21013-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Dibenzofuran	ND		146	ug/kg	05/23/24	05/24/24
Diethyl phthalate	ND		146	ug/kg	05/23/24	05/24/24
Dimethyl phthalate	ND		369	ug/kg	05/23/24	05/24/24
Di-n-butyl phthalate	ND		224	ug/kg	05/23/24	05/24/24
Fluoranthene	**183**		146	ug/kg	05/23/24	05/24/24
Fluorene	ND		146	ug/kg	05/23/24	05/24/24
Hexachlorobenzene	ND		146	ug/kg	05/23/24	05/24/24
Hexachlorobutadiene	ND		146	ug/kg	05/23/24	05/24/24
Hexachlorocyclopentadiene	ND		369	ug/kg	05/23/24	05/24/24
Hexachloroethane	ND		146	ug/kg	05/23/24	05/24/24
Indeno(1,2,3-cd)pyrene	ND		146	ug/kg	05/23/24	05/24/24
Isophorone	ND		146	ug/kg	05/23/24	05/24/24
Naphthalene	ND		146	ug/kg	05/23/24	05/24/24
N-Nitrosodimethylamine	ND		146	ug/kg	05/23/24	05/24/24
N-Nitrosodi-n-propylamine	ND		146	ug/kg	05/23/24	05/24/24
N-Nitrosodiphenylamine	ND		146	ug/kg	05/23/24	05/24/24
Pentachlorophenol	ND		369	ug/kg	05/23/24	05/24/24
Phenanthrene	ND		146	ug/kg	05/23/24	05/24/24
Pyrene	**193**		146	ug/kg	05/23/24	05/24/24
m&p-Cresol	ND		291	ug/kg	05/23/24	05/24/24
Pyridine	ND		146	ug/kg	05/23/24	05/24/24
Azobenzene	ND		146	ug/kg	05/23/24	05/24/24
Total Dichlorobenzene	ND		146	ug/kg	05/23/24	05/24/24

Surrogate(s)	Recovery%	Limits		
Nitrobenzene-d5	*38.9%*	*30-126*	05/23/24	05/24/24
p-Terphenyl-d14	*69.8%*	*47-130*	05/23/24	05/24/24
2-Fluorobiphenyl	*48.7%*	*34-130*	05/23/24	05/24/24
Phenol-d6	*32.6%*	*30-130*	05/23/24	05/24/24
2,4,6-Tribromophenol	*43.9%*	*30-130*	05/23/24	05/24/24
2-Fluorophenol	*36.0%*	*30-130*	05/23/24	05/24/24

Results: Semivolatile organic compounds

Sample: TP-4

Lab Number: 4E21013-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
1,2,4-Trichlorobenzene	ND		138	ug/kg	05/23/24	05/24/24
1,2-Dichlorobenzene	ND		138	ug/kg	05/23/24	05/24/24
1,3-Dichlorobenzene	ND		138	ug/kg	05/23/24	05/24/24
1,4-Dichlorobenzene	ND		138	ug/kg	05/23/24	05/24/24
Phenol	ND		138	ug/kg	05/23/24	05/24/24
2,4,5-Trichlorophenol	ND		138	ug/kg	05/23/24	05/24/24
2,4,6-Trichlorophenol	ND		138	ug/kg	05/23/24	05/24/24
2,4-Dichlorophenol	ND		138	ug/kg	05/23/24	05/24/24
2,4-Dimethylphenol	ND		349	ug/kg	05/23/24	05/24/24
2,4-Dinitrophenol	ND		349	ug/kg	05/23/24	05/24/24
2,4-Dinitrotoluene	ND		138	ug/kg	05/23/24	05/24/24
2,6-Dinitrotoluene	ND		138	ug/kg	05/23/24	05/24/24
2-Chloronaphthalene	ND		138	ug/kg	05/23/24	05/24/24
2-Chlorophenol	ND		138	ug/kg	05/23/24	05/24/24
2-Methylnaphthalene	ND		138	ug/kg	05/23/24	05/24/24
Nitrobenzene	ND		138	ug/kg	05/23/24	05/24/24
2-Methylphenol	ND		138	ug/kg	05/23/24	05/24/24
2-Nitroaniline	ND		138	ug/kg	05/23/24	05/24/24
2-Nitrophenol	ND		349	ug/kg	05/23/24	05/24/24
3,3'-Dichlorobenzidine	ND		349	ug/kg	05/23/24	05/24/24
3-Nitroaniline	ND		138	ug/kg	05/23/24	05/24/24
4,6-Dinitro-2-methylphenol	ND		349	ug/kg	05/23/24	05/24/24
4-Bromophenyl phenyl ether	ND		138	ug/kg	05/23/24	05/24/24
4-Chloro-3-methylphenol	ND		138	ug/kg	05/23/24	05/24/24
4-Chloroaniline	ND		138	ug/kg	05/23/24	05/24/24
4-Chlorophenyl phenyl ether	ND		138	ug/kg	05/23/24	05/24/24
4-Nitroaniline	ND		138	ug/kg	05/23/24	05/24/24
4-Nitrophenol	ND		349	ug/kg	05/23/24	05/24/24
Acenaphthene	ND		138	ug/kg	05/23/24	05/24/24
Acenaphthylene	ND		138	ug/kg	05/23/24	05/24/24
Aniline	ND		138	ug/kg	05/23/24	05/24/24
Anthracene	ND		138	ug/kg	05/23/24	05/24/24
Benzo(a)anthracene	ND		138	ug/kg	05/23/24	05/24/24
Benzo(a)pyrene	ND		138	ug/kg	05/23/24	05/24/24
Benzo(b)fluoranthene	ND		138	ug/kg	05/23/24	05/24/24
Benzo(g,h,i)perylene	ND		138	ug/kg	05/23/24	05/24/24
Benzo(k)fluoranthene	ND		138	ug/kg	05/23/24	05/24/24
Benzoic acid	ND		1060	ug/kg	05/23/24	05/24/24
Biphenyl	ND		21	ug/kg	05/23/24	05/24/24
Bis(2-chloroethoxy)methane	ND		138	ug/kg	05/23/24	05/24/24
Bis(2-chloroethyl)ether	ND		138	ug/kg	05/23/24	05/24/24
Bis(2-chloroisopropyl)ether	ND		138	ug/kg	05/23/24	05/24/24
Bis(2-ethylhexyl)phthalate	ND		423	ug/kg	05/23/24	05/24/24
Butyl benzyl phthalate	ND		138	ug/kg	05/23/24	05/24/24
Chrysene	ND		138	ug/kg	05/23/24	05/24/24
Di-n-octyl phthalate	ND		212	ug/kg	05/23/24	05/24/24
Dibenz(a,h)anthracene	ND		138	ug/kg	05/23/24	05/24/24

Results: Semivolatile organic compounds (Continued)

Sample: TP-4 (Continued)

Lab Number: 4E21013-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Dibenzofuran	ND		138	ug/kg	05/23/24	05/24/24
Diethyl phthalate	ND		138	ug/kg	05/23/24	05/24/24
Dimethyl phthalate	ND		349	ug/kg	05/23/24	05/24/24
Di-n-butyl phthalate	ND		212	ug/kg	05/23/24	05/24/24
Fluoranthene	ND		138	ug/kg	05/23/24	05/24/24
Fluorene	ND		138	ug/kg	05/23/24	05/24/24
Hexachlorobenzene	ND		138	ug/kg	05/23/24	05/24/24
Hexachlorobutadiene	ND		138	ug/kg	05/23/24	05/24/24
Hexachlorocyclopentadiene	ND		349	ug/kg	05/23/24	05/24/24
Hexachloroethane	ND		138	ug/kg	05/23/24	05/24/24
Indeno(1,2,3-cd)pyrene	ND		138	ug/kg	05/23/24	05/24/24
Isophorone	ND		138	ug/kg	05/23/24	05/24/24
Naphthalene	ND		138	ug/kg	05/23/24	05/24/24
N-Nitrosodimethylamine	ND		138	ug/kg	05/23/24	05/24/24
N-Nitrosodi-n-propylamine	ND		138	ug/kg	05/23/24	05/24/24
N-Nitrosodiphenylamine	ND		138	ug/kg	05/23/24	05/24/24
Pentachlorophenol	ND		349	ug/kg	05/23/24	05/24/24
Phenanthrene	ND		138	ug/kg	05/23/24	05/24/24
Pyrene	ND		138	ug/kg	05/23/24	05/24/24
m&p-Cresol	ND		275	ug/kg	05/23/24	05/24/24
Pyridine	ND		138	ug/kg	05/23/24	05/24/24
Azobenzene	ND		138	ug/kg	05/23/24	05/24/24
Total Dichlorobenzene	ND		138	ug/kg	05/23/24	05/24/24

Surrogate(s)	Recovery%	Limits		
Nitrobenzene-d5	*41.4%*	*30-126*	05/23/24	05/24/24
p-Terphenyl-d14	*69.3%*	*47-130*	05/23/24	05/24/24
2-Fluorobiphenyl	*51.0%*	*34-130*	05/23/24	05/24/24
Phenol-d6	*33.5%*	*30-130*	05/23/24	05/24/24
2,4,6-Tribromophenol	*44.8%*	*30-130*	05/23/24	05/24/24
2-Fluorophenol	*34.0%*	*30-130*	05/23/24	05/24/24

Results: Polychlorinated Biphenyls (PCBs)

Sample: TP-1

Lab Number: 4E21013-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Aroclor-1016	ND		71	ug/kg	05/22/24	05/24/24
Aroclor-1221	ND		71	ug/kg	05/22/24	05/24/24
Aroclor-1232	ND		71	ug/kg	05/22/24	05/24/24
Aroclor-1242	ND		71	ug/kg	05/22/24	05/24/24
Aroclor-1248	ND		71	ug/kg	05/22/24	05/24/24
Aroclor-1254	ND		71	ug/kg	05/22/24	05/24/24
Aroclor-1260	ND		71	ug/kg	05/22/24	05/24/24
Aroclor-1262	ND		71	ug/kg	05/22/24	05/24/24
Aroclor-1268	ND		71	ug/kg	05/22/24	05/24/24
PCBs (Total)	ND		71	ug/kg	05/22/24	05/24/24

Surrogate(s)	Recovery%	Limits		
2,4,5,6-Tetrachloro-m-xylene (TCMX)	*37.2%*	*36.2-130*	05/22/24	05/24/24
Decachlorobiphenyl (DCBP)	*68.2%*	*43.3-130*	05/22/24	05/24/24

Results: Polychlorinated Biphenyls (PCBs)

Sample: TP-2

Lab Number: 4E21013-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Aroclor-1016	ND		72	ug/kg	05/22/24	05/24/24
Aroclor-1221	ND		72	ug/kg	05/22/24	05/24/24
Aroclor-1232	ND		72	ug/kg	05/22/24	05/24/24
Aroclor-1242	ND		72	ug/kg	05/22/24	05/24/24
Aroclor-1248	ND		72	ug/kg	05/22/24	05/24/24
Aroclor-1254	ND		72	ug/kg	05/22/24	05/24/24
Aroclor-1260	ND		72	ug/kg	05/22/24	05/24/24
Aroclor-1262	ND		72	ug/kg	05/22/24	05/24/24
Aroclor-1268	ND		72	ug/kg	05/22/24	05/24/24
PCBs (Total)	ND		72	ug/kg	05/22/24	05/24/24

Surrogate(s)	Recovery%	Limits		
2,4,5,6-Tetrachloro-m-xylene (TCMX)	*53.8%*	*36.2-130*	05/22/24	05/24/24
Decachlorobiphenyl (DCBP)	*129%*	*43.3-130*	05/22/24	05/24/24

Results: Polychlorinated Biphenyls (PCBs)

Sample: TP-3

Lab Number: 4E21013-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Aroclor-1016	ND		72	ug/kg	05/22/24	05/24/24
Aroclor-1221	ND		72	ug/kg	05/22/24	05/24/24
Aroclor-1232	ND		72	ug/kg	05/22/24	05/24/24
Aroclor-1242	ND		72	ug/kg	05/22/24	05/24/24
Aroclor-1248	ND		72	ug/kg	05/22/24	05/24/24
Aroclor-1254	ND		72	ug/kg	05/22/24	05/24/24
Aroclor-1260	ND		72	ug/kg	05/22/24	05/24/24
Aroclor-1262	ND		72	ug/kg	05/22/24	05/24/24
Aroclor-1268	ND		72	ug/kg	05/22/24	05/24/24
PCBs (Total)	ND		72	ug/kg	05/22/24	05/24/24

Surrogate(s)	Recovery%	Limits		
2,4,5,6-Tetrachloro-m-xylene (TCMX)	*36.4%*	*36.2-130*	05/22/24	05/24/24
Decachlorobiphenyl (DCBP)	*59.2%*	*43.3-130*	05/22/24	05/24/24

Results: Polychlorinated Biphenyls (PCBs)

Sample: TP-4

Lab Number: 4E21013-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Aroclor-1016	ND		68	ug/kg	05/22/24	05/24/24
Aroclor-1221	ND		68	ug/kg	05/22/24	05/24/24
Aroclor-1232	ND		68	ug/kg	05/22/24	05/24/24
Aroclor-1242	ND		68	ug/kg	05/22/24	05/24/24
Aroclor-1248	ND		68	ug/kg	05/22/24	05/24/24
Aroclor-1254	ND		68	ug/kg	05/22/24	05/24/24
Aroclor-1260	ND		68	ug/kg	05/22/24	05/24/24
Aroclor-1262	ND		68	ug/kg	05/22/24	05/24/24
Aroclor-1268	ND		68	ug/kg	05/22/24	05/24/24
PCBs (Total)	ND		68	ug/kg	05/22/24	05/24/24

Surrogate(s)	Recovery%	Limits		
2,4,5,6-Tetrachloro-m-xylene (TCMX)	*38.5%*	*36.2-130*	05/22/24	05/24/24
Decachlorobiphenyl (DCBP)	*86.1%*	*43.3-130*	05/22/24	05/24/24

Results: Total Petroleum Hydrocarbons

Sample: TP-1

Lab Number: 4E21013-01 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Total Petroleum Hydrocarbons	ND		29	mg/kg	05/23/24	05/28/24
Surrogate(s)	Recovery%		Limits			
Chlorooctadecane	*111%*		*50-130*		05/23/24	05/28/24

Results: Total Petroleum Hydrocarbons

Sample: TP-2

Lab Number: 4E21013-02 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Total Petroleum Hydrocarbons	ND		30	mg/kg	05/23/24	05/28/24
Surrogate(s)	Recovery%		Limits			
Chlorooctadecane	*99.8%*		*50-130*		05/23/24	05/28/24

Results: Total Petroleum Hydrocarbons

Sample: TP-3

Lab Number: 4E21013-03 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Total Petroleum Hydrocarbons	ND		30	mg/kg	05/23/24	05/28/24
Surrogate(s)	Recovery%		Limits			
Chlorooctadecane	*85.1%*		*50-130*		05/23/24	05/28/24

Results: Total Petroleum Hydrocarbons

Sample: TP-4

Lab Number: 4E21013-04 (Soil)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Total Petroleum Hydrocarbons	ND		27	mg/kg	05/23/24	05/28/24
Surrogate(s)	Recovery%		Limits			
Chlorooctadecane	*84.7%*		*50-130*		05/23/24	05/28/24

Quality Control

General Chemistry

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4E1110 - pH										
LCS (B4E1110-BS1)					Prepared & Analyzed: 05/28/24					
pH	7.0			SU				0-200		
LCS (B4E1110-BS2)					Prepared & Analyzed: 05/28/24					
pH	7.0			SU				0-200		
Duplicate (B4E1110-DUP1)		Source: 4E21013-01			Prepared & Analyzed: 05/28/24					
pH	5.8			SU		5.9			0.681	200
Batch: B4E1169 - Flashpoint-EPA 1010A-Mod										
LCS (B4E1169-BS1)					Prepared & Analyzed: 05/28/24					
Flashpoint	85		70	degrees F	80.0		106	90-110		
Duplicate (B4E1169-DUP1)		Source: 4E24033-01			Prepared & Analyzed: 05/28/24					
Flashpoint	> 200		70	degrees F		ND				20
Batch: B4E1217 - Conductivity										
Blank (B4E1217-BLK1)					Prepared & Analyzed: 05/28/24					
Specific Conductance	ND		2.0	uS/cm						
Duplicate (B4E1217-DUP1)		Source: 4E21013-01			Prepared & Analyzed: 05/28/24					
Specific Conductance	10.1		2.0	uS/cm		10.1			0.00	200

Quality Control
(Continued)

Reactivity

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4E1127 - Reactivity										
Blank (B4E1127-BLK1)					Prepared & Analyzed: 05/28/24					
Cyanide	ND		0.2	mg/kg						
Blank (B4E1127-BLK2)					Prepared & Analyzed: 05/28/24					
Cyanide	ND		0.2	mg/kg						
Duplicate (B4E1127-DUP1)		Source: 4E20038-01			Prepared & Analyzed: 05/28/24					
Cyanide	ND		0.2	mg/kg dry		ND				20
Batch: B4E1130 - Reactivity										
Blank (B4E1130-BLK1)					Prepared & Analyzed: 05/28/24					
Sulfide	ND		0.1	mg/kg						
Blank (B4E1130-BLK2)					Prepared & Analyzed: 05/28/24					
Sulfide	ND		0.1	mg/kg						
LCS (B4E1130-BS1)					Prepared & Analyzed: 05/28/24					
Sulfide	3.7		0.1	mg/kg	4.00		93.5	90-110		
LCS (B4E1130-BS2)					Prepared & Analyzed: 05/28/24					
Sulfide	3.7		0.1	mg/kg	4.00		92.5	90-110		
Duplicate (B4E1130-DUP1)		Source: 4E20038-01			Prepared & Analyzed: 05/28/24					
Sulfide	ND		0.1	mg/kg dry		ND				20
Matrix Spike (B4E1130-MS1)		Source: 4E20038-01			Prepared & Analyzed: 05/28/24					
Sulfide	4.2		0.1	mg/kg dry	4.20	ND	100	80-120		

Quality Control
(Continued)

Total Metals

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4E0928 - Metals Digestion Soils										
Blank (B4E0928-BLK1)					Prepared: 05/22/24 Analyzed: 05/24/24					
Selenium	ND		1.00	mg/kg						
Arsenic	ND		1.00	mg/kg						
Chromium	ND		0.50	mg/kg						
Barium	ND		0.33	mg/kg						
Nickel	ND		0.50	mg/kg						
Cadmium	ND		0.50	mg/kg						
Silver	ND		1.00	mg/kg						
Zinc	ND		2.0	mg/kg						
Beryllium	ND		0.33	mg/kg						
Antimony	ND		0.66	mg/kg						
Lead	ND		0.50	mg/kg						
Vanadium	ND		0.33	mg/kg						
Thallium	ND		0.33	mg/kg						
LCS (B4E0928-BS1)					Prepared: 05/22/24 Analyzed: 05/24/24					
Selenium	18.3		1.00	mg/kg	20.0		91.7	85-115		
Zinc	115		2.0	mg/kg	100		115	85-115		
Vanadium	99.5		0.33	mg/kg	100		99.5	85-115		
Antimony	97.7		0.66	mg/kg	100		97.7	85-115		
Cadmium	95.6		0.50	mg/kg	100		95.6	85-115		
Lead	91.9		0.50	mg/kg	100		91.9	85-115		
Chromium	99.6		0.50	mg/kg	100		99.6	85-115		
Nickel	91.7		0.50	mg/kg	100		91.7	85-112		
Beryllium	19.5		0.33	mg/kg	20.0		97.7	85-115		
Barium	98.8		0.33	mg/kg	100		98.8	85-115		
Arsenic	19.7		1.00	mg/kg	20.0		98.7	85-115		
Silver	39.5		1.00	mg/kg	40.0		98.7	85-115		
Thallium	88.3		0.33	mg/kg	100		88.3	85-115		

Quality Control
(Continued)

Total Metals (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4E0928 - Metals Digestion Soils (Continued)										
LCS Dup (B4E0928-BSD1)					Prepared: 05/22/24 Analyzed: 05/24/24					
Selenium	17.6		1.00	mg/kg	20.0		88.2	85-115	3.88	200
Barium	97.0		0.33	mg/kg	100		97.0	85-115	1.83	200
Vanadium	98.6		0.33	mg/kg	100		98.6	85-115	0.857	200
Chromium	98.3		0.50	mg/kg	100		98.3	85-115	1.28	200
Silver	39.1		1.00	mg/kg	40.0		97.6	85-115	1.12	200
Thallium	85.8		0.33	mg/kg	100		85.8	85-115	2.95	10
Batch: B4E0969 - Metals Cold-Vapor Mercury										
Blank (B4E0969-BLK1)					Prepared & Analyzed: 05/22/24					
Mercury	ND		0.100	mg/kg						
LCS (B4E0969-BS1)					Prepared & Analyzed: 05/22/24					
Mercury	0.518		0.100	mg/kg	0.500		104	93-114		
LCS Dup (B4E0969-BSD1)					Prepared & Analyzed: 05/22/24					
Mercury	0.530		0.100	mg/kg	0.500		106	93-114	2.33	200
Matrix Spike (B4E0969-MS1)		Source: 4E21013-01			Prepared & Analyzed: 05/22/24					
Mercury	0.584		0.108	mg/kg dry	0.541	0.073	94.5	80-120		
Matrix Spike (B4E0969-MS2)		Source: 4E21079-01			Prepared & Analyzed: 05/22/24					
Mercury	0.528		0.100	mg/kg dry	0.498	0.022	102	80-120		
Matrix Spike Dup (B4E0969-MSD1)		Source: 4E21013-01			Prepared & Analyzed: 05/22/24					
Mercury	0.581		0.110	mg/kg dry	0.549	0.073	92.7	80-120	0.489	20

Volatile Organic Compounds 8260C (5035-LL)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4E0924 - EPA 5035										
Blank (B4E0924-BLK1)					Prepared & Analyzed: 05/22/24					
Acetone	ND		5	ug/kg						
Benzene	ND		5	ug/kg						
Bromobenzene	ND		5	ug/kg						
Bromochloromethane	ND		5	ug/kg						
Bromodichloromethane	ND		5	ug/kg						
Bromoform	ND		5	ug/kg						
Bromomethane	ND		5	ug/kg						
2-Butanone	ND		5	ug/kg						
tert-Butyl alcohol	ND		5	ug/kg						
sec-Butylbenzene	ND		5	ug/kg						
n-Butylbenzene	ND		5	ug/kg						
tert-Butylbenzene	ND		5	ug/kg						
Methyl t-butyl ether (MTBE)	ND		5	ug/kg						
Carbon Disulfide	ND		5	ug/kg						
Carbon Tetrachloride	ND		5	ug/kg						
Chlorobenzene	ND		5	ug/kg						
Chloroethane	ND		5	ug/kg						
Chloroform	ND		5	ug/kg						
Chloromethane	ND		5	ug/kg						
4-Chlorotoluene	ND		5	ug/kg						
2-Chlorotoluene	ND		5	ug/kg						
1,2-Dibromo-3-chloropropane (DBCP)	ND		5	ug/kg						
Dibromochloromethane	ND		5	ug/kg						
1,2-Dibromoethane (EDB)	ND		5	ug/kg						
Dibromomethane	ND		5	ug/kg						
1,2-Dichlorobenzene	ND		5	ug/kg						
1,3-Dichlorobenzene	ND		5	ug/kg						
1,4-Dichlorobenzene	ND		5	ug/kg						
1,1-Dichloroethane	ND		5	ug/kg						
1,2-Dichloroethane	ND		5	ug/kg						
1,2 Dichloroethene, Total	ND		5	ug/kg						
trans-1,2-Dichloroethene	ND		5	ug/kg						
cis-1,2-Dichloroethene	ND		5	ug/kg						
1,1-Dichloroethene	ND		5	ug/kg						
1,2-Dichloropropane	ND		5	ug/kg						
2,2-Dichloropropane	ND		5	ug/kg						
cis-1,3-Dichloropropene	ND		5	ug/kg						
trans-1,3-Dichloropropene	ND		5	ug/kg						
1,1-Dichloropropene	ND		5	ug/kg						
1,3-Dichloropropene (cis + trans)	ND		5	ug/kg						
Diethyl ether	ND		5	ug/kg						
1,4-Dioxane	ND		100	ug/kg						
Ethylbenzene	ND		5	ug/kg						
Hexachlorobutadiene	ND		5	ug/kg						
2-Hexanone	ND		5	ug/kg						
Isopropylbenzene	ND		5	ug/kg						
p-Isopropyltoluene	ND		5	ug/kg						
Methylene Chloride	ND		5	ug/kg						
4-Methyl-2-pentanone	ND		5	ug/kg						
Naphthalene	ND		5	ug/kg						
n-Propylbenzene	ND		5	ug/kg						
Styrene	ND		5	ug/kg						
1,1,1,2-Tetrachloroethane	ND		5	ug/kg						
Tetrachloroethene	ND		5	ug/kg						
Tetrahydrofuran	ND		5	ug/kg						
Toluene	ND		5	ug/kg						
1,2,4-Trichlorobenzene	ND		5	ug/kg						

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4E0924 - EPA 5035 (Continued)										
Blank (B4E0924-BLK1)					Prepared & Analyzed: 05/22/24					
1,2,3-Trichlorobenzene	ND		5	ug/kg						
1,1,2-Trichloroethane	ND		5	ug/kg						
1,1,1-Trichloroethane	ND		5	ug/kg						
Trichloroethene	ND		5	ug/kg						
1,2,3-Trichloropropane	ND		5	ug/kg						
1,3,5-Trimethylbenzene	ND		5	ug/kg						
1,2,4-Trimethylbenzene	ND		5	ug/kg						
Vinyl Chloride	ND		5	ug/kg						
o-Xylene	ND		5	ug/kg						
m&p-Xylene	ND		10	ug/kg						
Total xylenes	ND		5	ug/kg						
1,1,2,2-Tetrachloroethane	ND		5	ug/kg						
tert-Amyl methyl ether	ND		5	ug/kg						
1,3-Dichloropropane	ND		5	ug/kg						
Ethyl tert-butyl ether	ND		5	ug/kg						
Diisopropyl ether	ND		5	ug/kg						
Trichlorofluoromethane	ND		5	ug/kg						
Dichlorodifluoromethane	ND		5	ug/kg						
Surrogate: 4-Bromofluorobenzene			*46.4*	ug/kg	*50.0*		*92.7*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4			*52.7*	ug/kg	*50.0*		*105*	*70-130*		
Surrogate: Toluene-d8			*48.2*	ug/kg	*50.0*		*96.4*	*70-130*		
LCS (B4E0924-BS1)					Prepared & Analyzed: 05/22/24					
Acetone	44		5	ug/kg	50.0		88.0	50-150		
Benzene	54		5	ug/kg	50.0		107	70-130		
Bromobenzene	58		5	ug/kg	50.0		115	70-130		
Bromochloromethane	61		5	ug/kg	50.0		122	70-130		
Bromodichloromethane	57		5	ug/kg	50.0		114	70-130		
Bromoform	55		5	ug/kg	50.0		109	70-130		
Bromomethane	64		5	ug/kg	50.0		128	50-150		
2-Butanone	42		5	ug/kg	50.0		85.0	50-150		
tert-Butyl alcohol	20		5	ug/kg	50.0		40.2	70-130		
sec-Butylbenzene	56		5	ug/kg	50.0		112	70-130		
n-Butylbenzene	60		5	ug/kg	50.0		119	70-130		
tert-Butylbenzene	55		5	ug/kg	50.0		111	70-130		
Methyl t-butyl ether (MTBE)	60		5	ug/kg	50.0		120	70-130		
Carbon Disulfide	57		5	ug/kg	50.0		114	50-150		
Carbon Tetrachloride	58		5	ug/kg	50.0		115	70-130		
Chlorobenzene	55		5	ug/kg	50.0		110	70-130		
Chloroethane	59		5	ug/kg	50.0		119	50-150		
Chloroform	53		5	ug/kg	50.0		106	70-130		
Chloromethane	42		5	ug/kg	50.0		83.6	50-150		
4-Chlorotoluene	56		5	ug/kg	50.0		113	70-130		
2-Chlorotoluene	54		5	ug/kg	50.0		108	70-130		
1,2-Dibromo-3-chloropropane (DBCP)	50		5	ug/kg	50.0		99.9	70-130		
Dibromochloromethane	52		5	ug/kg	50.0		103	70-130		
1,2-Dibromoethane (EDB)	56		5	ug/kg	50.0		113	70-130		
Dibromomethane	58		5	ug/kg	50.0		117	60-140		
1,2-Dichlorobenzene	55		5	ug/kg	50.0		111	70-130		
1,3-Dichlorobenzene	57		5	ug/kg	50.0		115	70-130		
1,4-Dichlorobenzene	57		5	ug/kg	50.0		114	70-130		
1,1-Dichloroethane	54		5	ug/kg	50.0		108	70-130		
1,2-Dichloroethane	50		5	ug/kg	50.0		101	70-130		
trans-1,2-Dichloroethene	56		5	ug/kg	50.0		112	70-130		
cis-1,2-Dichloroethene	53		5	ug/kg	50.0		107	70-130		
1,1-Dichloroethene	57		5	ug/kg	50.0		114	70-130		
1,2-Dichloropropane	53		5	ug/kg	50.0		106	70-130		

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4E0924 - EPA 5035 (Continued)										
LCS (B4E0924-BS1)					Prepared & Analyzed: 05/22/24					
2,2-Dichloropropane	58		5	ug/kg	50.0		116	70-130		
cis-1,3-Dichloropropene	52		5	ug/kg	50.0		105	70-130		
trans-1,3-Dichloropropene	49		5	ug/kg	50.0		98.6	70-130		
1,1-Dichloropropene	61		5	ug/kg	50.0		121	70-130		
Diethyl ether	62		5	ug/kg	50.0		124	60-140		
1,4-Dioxane	217		100	ug/kg	250		86.7	0-200		
Ethylbenzene	55		5	ug/kg	50.0		110	70-130		
Hexachlorobutadiene	59		5	ug/kg	50.0		118	70-130		
2-Hexanone	50		5	ug/kg	50.0		99.6	50-150		
Isopropylbenzene	55		5	ug/kg	50.0		111	70-130		
p-Isopropyltoluene	56		5	ug/kg	50.0		112	70-130		
Methylene Chloride	56		5	ug/kg	50.0		112	60-140		
4-Methyl-2-pentanone	55		5	ug/kg	50.0		109	50-150		
Naphthalene	62		5	ug/kg	50.0		124	70-130		
n-Propylbenzene	54		5	ug/kg	50.0		109	70-130		
Styrene	55		5	ug/kg	50.0		110	70-130		
1,1,1,2-Tetrachloroethane	62		5	ug/kg	50.0		123	70-130		
Tetrachloroethene	57		5	ug/kg	50.0		114	70-130		
Tetrahydrofuran	61		5	ug/kg	50.0		122	50-150		
Toluene	54		5	ug/kg	50.0		108	70-130		
1,2,4-Trichlorobenzene	60		5	ug/kg	50.0		121	70-130		
1,2,3-Trichlorobenzene	61		5	ug/kg	50.0		123	70-130		
1,1,2-Trichloroethane	52		5	ug/kg	50.0		104	70-130		
1,1,1-Trichloroethane	58		5	ug/kg	50.0		115	70-130		
Trichloroethene	50		5	ug/kg	50.0		99.0	70-130		
1,2,3-Trichloropropane	50		5	ug/kg	50.0		100	70-130		
1,3,5-Trimethylbenzene	55		5	ug/kg	50.0		110	70-130		
1,2,4-Trimethylbenzene	56		5	ug/kg	50.0		112	70-130		
Vinyl Chloride	46		5	ug/kg	50.0		91.2	50-150		
o-Xylene	57		5	ug/kg	50.0		113	70-130		
m&p-Xylene	99		10	ug/kg	100		98.6	70-130		
1,1,2,2-Tetrachloroethane	58		5	ug/kg	50.0		116	70-130		
tert-Amyl methyl ether	60		5	ug/kg	50.0		121	70-130		
1,3-Dichloropropane	54		5	ug/kg	50.0		109	70-130		
Ethyl tert-butyl ether	57		5	ug/kg	50.0		113	70-130		
Trichlorofluoromethane	49		5	ug/kg	50.0		98.5	50-150		
Dichlorodifluoromethane	48		5	ug/kg	50.0		95.2	50-150		
Surrogate: 4-Bromofluorobenzene			*47.4*	ug/kg	*50.0*		*94.8*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4			*49.3*	ug/kg	*50.0*		*98.5*	*70-130*		
Surrogate: Toluene-d8			*47.0*	ug/kg	*50.0*		*94.0*	*70-130*		

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4E0924 - EPA 5035 (Continued)										
LCS Dup (B4E0924-BSD1)					Prepared & Analyzed: 05/22/24					
Acetone	45		5	ug/kg	50.0		89.4	50-150	1.53	30
Benzene	49		5	ug/kg	50.0		97.4	70-130	9.47	20
Bromobenzene	54		5	ug/kg	50.0		108	70-130	6.63	20
Bromochloromethane	53		5	ug/kg	50.0		106	70-130	13.4	20
Bromodichloromethane	51		5	ug/kg	50.0		102	70-130	11.6	20
Bromoform	52		5	ug/kg	50.0		103	70-130	5.66	20
Bromomethane	49		5	ug/kg	50.0		98.1	50-150	26.3	30
2-Butanone	44		5	ug/kg	50.0		87.2	50-150	2.65	30
tert-Butyl alcohol	19		5	ug/kg	50.0		37.5	70-130	6.96	20
sec-Butylbenzene	55		5	ug/kg	50.0		110	70-130	1.12	20
n-Butylbenzene	55		5	ug/kg	50.0		111	70-130	7.54	20
tert-Butylbenzene	56		5	ug/kg	50.0		111	70-130	0.198	20
Methyl t-butyl ether (MTBE)	55		5	ug/kg	50.0		110	70-130	9.05	20
Carbon Disulfide	52		5	ug/kg	50.0		103	50-150	10.2	40
Carbon Tetrachloride	50		5	ug/kg	50.0		100	70-130	13.8	20
Chlorobenzene	53		5	ug/kg	50.0		106	70-130	3.75	20
Chloroethane	51		5	ug/kg	50.0		102	50-150	15.4	30
Chloroform	46		5	ug/kg	50.0		92.4	70-130	13.3	20
Chloromethane	38		5	ug/kg	50.0		75.3	50-150	10.4	30
4-Chlorotoluene	52		5	ug/kg	50.0		104	70-130	7.88	20
2-Chlorotoluene	50		5	ug/kg	50.0		101	70-130	6.37	20
1,2-Dibromo-3-chloropropane (DBCP)	47		5	ug/kg	50.0		94.2	70-130	5.88	20
Dibromochloromethane	48		5	ug/kg	50.0		95.3	70-130	7.94	20
1,2-Dibromoethane (EDB)	53		5	ug/kg	50.0		106	70-130	5.98	20
Dibromomethane	53		5	ug/kg	50.0		106	60-140	9.73	30
1,2-Dichlorobenzene	53		5	ug/kg	50.0		105	70-130	4.82	20
1,3-Dichlorobenzene	55		5	ug/kg	50.0		111	70-130	3.78	20
1,4-Dichlorobenzene	54		5	ug/kg	50.0		108	70-130	5.33	20
1,1-Dichloroethane	47		5	ug/kg	50.0		93.7	70-130	14.1	20
1,2-Dichloroethane	47		5	ug/kg	50.0		94.6	70-130	6.18	20
trans-1,2-Dichloroethene	49		5	ug/kg	50.0		98.7	70-130	12.6	20
cis-1,2-Dichloroethene	48		5	ug/kg	50.0		96.5	70-130	10.0	20
1,1-Dichloroethene	49		5	ug/kg	50.0		97.7	70-130	15.6	20
1,2-Dichloropropane	47		5	ug/kg	50.0		94.9	70-130	11.4	20
2,2-Dichloropropane	50		5	ug/kg	50.0		100	70-130	15.0	20
cis-1,3-Dichloropropene	47		5	ug/kg	50.0		93.4	70-130	11.3	20
trans-1,3-Dichloropropene	46		5	ug/kg	50.0		91.4	70-130	7.54	20
1,1-Dichloropropene	52		5	ug/kg	50.0		105	70-130	14.4	20
Diethyl ether	56		5	ug/kg	50.0		111	60-140	11.0	30
1,4-Dioxane	227		100	ug/kg	250		90.9	0-200	4.72	50
Ethylbenzene	51		5	ug/kg	50.0		103	70-130	7.17	20
Hexachlorobutadiene	56		5	ug/kg	50.0		112	70-130	5.80	20
2-Hexanone	49		5	ug/kg	50.0		98.4	50-150	1.21	20
Isopropylbenzene	51		5	ug/kg	50.0		102	70-130	7.80	20
p-Isopropyltoluene	53		5	ug/kg	50.0		106	70-130	5.13	20
Methylene Chloride	49		5	ug/kg	50.0		98.1	60-140	13.6	30
4-Methyl-2-pentanone	52		5	ug/kg	50.0		104	50-150	5.08	20
Naphthalene	60		5	ug/kg	50.0		120	70-130	2.87	20
n-Propylbenzene	50		5	ug/kg	50.0		99.8	70-130	8.66	20
Styrene	51		5	ug/kg	50.0		102	70-130	6.89	20
1,1,1,2-Tetrachloroethane	57		5	ug/kg	50.0		115	70-130	7.32	20
Tetrachloroethene	50		5	ug/kg	50.0		101	70-130	12.7	20
Tetrahydrofuran	58		5	ug/kg	50.0		116	50-150	4.57	40
Toluene	48		5	ug/kg	50.0		95.1	70-130	12.9	20
1,2,4-Trichlorobenzene	57		5	ug/kg	50.0		114	70-130	5.86	20
1,2,3-Trichlorobenzene	57		5	ug/kg	50.0		114	70-130	7.43	20
1,1,2-Trichloroethane	50		5	ug/kg	50.0		99.5	70-130	4.75	30

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4E0924 - EPA 5035 (Continued)										
LCS Dup (B4E0924-BSD1)					Prepared & Analyzed: 05/22/24					
1,1,1-Trichloroethane	49		5	ug/kg	50.0		98.7	70-130	15.3	20
Trichloroethene	47		5	ug/kg	50.0		93.9	70-130	5.31	20
1,2,3-Trichloropropane	49		5	ug/kg	50.0		97.2	70-130	3.30	20
1,3,5-Trimethylbenzene	52		5	ug/kg	50.0		104	70-130	5.88	20
1,2,4-Trimethylbenzene	53		5	ug/kg	50.0		106	70-130	5.57	20
Vinyl Chloride	40		5	ug/kg	50.0		80.8	50-150	12.1	30
o-Xylene	52		5	ug/kg	50.0		105	70-130	8.03	20
m&p-Xylene	93		10	ug/kg	100		93.3	70-130	5.51	20
1,1,2,2-Tetrachloroethane	57		5	ug/kg	50.0		114	70-130	2.04	20
tert-Amyl methyl ether	56		5	ug/kg	50.0		113	70-130	6.85	20
1,3-Dichloropropane	49		5	ug/kg	50.0		97.7	70-130	10.7	20
Ethyl tert-butyl ether	52		5	ug/kg	50.0		103	70-130	8.94	20
Trichlorofluoromethane	45		5	ug/kg	50.0		90.2	50-150	8.82	20
Dichlorodifluoromethane	43		5	ug/kg	50.0		86.5	50-150	9.66	30
Surrogate: 4-Bromofluorobenzene			*47.5*	ug/kg	*50.0*		*95.0*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4			*52.8*	ug/kg	*50.0*		*106*	*70-130*		
Surrogate: Toluene-d8			*47.4*	ug/kg	*50.0*		*94.7*	*70-130*		
Batch: B4E1182 - EPA 5035										
Blank (B4E1182-BLK1)					Prepared & Analyzed: 05/28/24					
Acetone	ND		5	ug/kg						
Benzene	ND		5	ug/kg						
Bromobenzene	ND		5	ug/kg						
Bromochloromethane	ND		5	ug/kg						
Bromodichloromethane	ND		5	ug/kg						
Bromoform	ND		5	ug/kg						
Bromomethane	ND		5	ug/kg						
2-Butanone	ND		5	ug/kg						
tert-Butyl alcohol	ND		5	ug/kg						
sec-Butylbenzene	ND		5	ug/kg						
n-Butylbenzene	ND		5	ug/kg						
tert-Butylbenzene	ND		5	ug/kg						
Methyl t-butyl ether (MTBE)	ND		5	ug/kg						
Carbon Disulfide	ND		5	ug/kg						
Carbon Tetrachloride	ND		5	ug/kg						
Chlorobenzene	ND		5	ug/kg						
Chloroethane	ND		5	ug/kg						
Chloroform	ND		5	ug/kg						
Chloromethane	ND		5	ug/kg						
4-Chlorotoluene	ND		5	ug/kg						
2-Chlorotoluene	ND		5	ug/kg						
1,2-Dibromo-3-chloropropane (DBCP)	ND		5	ug/kg						
Dibromochloromethane	ND		5	ug/kg						
1,2-Dibromoethane (EDB)	ND		5	ug/kg						
Dibromomethane	ND		5	ug/kg						
1,2-Dichlorobenzene	ND		5	ug/kg						
1,3-Dichlorobenzene	ND		5	ug/kg						
1,4-Dichlorobenzene	ND		5	ug/kg						
1,1-Dichloroethane	ND		5	ug/kg						
1,2-Dichloroethane	ND		5	ug/kg						
trans-1,2-Dichloroethene	ND		5	ug/kg						
1,2 Dichloroethene, Total	ND		5	ug/kg						
cis-1,2-Dichloroethene	ND		5	ug/kg						
1,1-Dichloroethene	ND		5	ug/kg						
1,2-Dichloropropane	ND		5	ug/kg						
2,2-Dichloropropane	ND		5	ug/kg						
cis-1,3-Dichloropropene	ND		5	ug/kg						

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4E1182 - EPA 5035 (Continued)										
Blank (B4E1182-BLK1)					Prepared & Analyzed: 05/28/24					
trans-1,3-Dichloropropene	ND		5	ug/kg						
1,1-Dichloropropene	ND		5	ug/kg						
1,3-Dichloropropene (cis + trans)	ND		5	ug/kg						
Diethyl ether	ND		5	ug/kg						
1,4-Dioxane	ND		100	ug/kg						
Ethylbenzene	ND		5	ug/kg						
Hexachlorobutadiene	ND		5	ug/kg						
2-Hexanone	ND		5	ug/kg						
Isopropylbenzene	ND		5	ug/kg						
p-Isopropyltoluene	ND		5	ug/kg						
Methylene Chloride	ND		5	ug/kg						
4-Methyl-2-pentanone	ND		5	ug/kg						
Naphthalene	ND		5	ug/kg						
n-Propylbenzene	ND		5	ug/kg						
Styrene	ND		5	ug/kg						
1,1,1,2-Tetrachloroethane	ND		5	ug/kg						
Tetrachloroethene	ND		5	ug/kg						
Tetrahydrofuran	ND		5	ug/kg						
Toluene	ND		5	ug/kg						
1,2,4-Trichlorobenzene	ND		5	ug/kg						
1,2,3-Trichlorobenzene	ND		5	ug/kg						
1,1,2-Trichloroethane	ND		5	ug/kg						
1,1,1-Trichloroethane	ND		5	ug/kg						
Trichloroethene	ND		5	ug/kg						
1,2,3-Trichloropropane	ND		5	ug/kg						
1,3,5-Trimethylbenzene	ND		5	ug/kg						
1,2,4-Trimethylbenzene	ND		5	ug/kg						
Vinyl Chloride	ND		5	ug/kg						
o-Xylene	ND		5	ug/kg						
m&p-Xylene	ND		10	ug/kg						
Total xylenes	ND		5	ug/kg						
1,1,2,2-Tetrachloroethane	ND		5	ug/kg						
tert-Amyl methyl ether	ND		5	ug/kg						
1,3-Dichloropropane	ND		5	ug/kg						
Ethyl tert-butyl ether	ND		5	ug/kg						
Diisopropyl ether	ND		5	ug/kg						
Trichlorofluoromethane	ND		5	ug/kg						
Dichlorodifluoromethane	ND		5	ug/kg						
Surrogate: 4-Bromofluorobenzene			*48.8*	ug/kg	*50.0*		*97.6*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4			*48.8*	ug/kg	*50.0*		*97.7*	*70-130*		
Surrogate: Toluene-d8			*49.9*	ug/kg	*50.0*		*99.9*	*70-130*		

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4E1182 - EPA 5035 (Continued)										
LCS (B4E1182-BS1)					Prepared & Analyzed: 05/28/24					
Acetone	56		5	ug/kg	50.0		112	50-150		
Benzene	40		5	ug/kg	50.0		80.9	70-130		
Bromobenzene	38		5	ug/kg	50.0		76.2	70-130		
Bromochloromethane	41		5	ug/kg	50.0		81.2	70-130		
Bromodichloromethane	39		5	ug/kg	50.0		78.5	70-130		
Bromoform	35		5	ug/kg	50.0		70.3	70-130		
Bromomethane	57		5	ug/kg	50.0		114	50-150		
2-Butanone	54		5	ug/kg	50.0		108	50-150		
tert-Butyl alcohol	58		5	ug/kg	50.0		117	70-130		
sec-Butylbenzene	40		5	ug/kg	50.0		79.6	70-130		
n-Butylbenzene	44		5	ug/kg	50.0		88.7	70-130		
tert-Butylbenzene	36		5	ug/kg	50.0		71.9	70-130		
Methyl t-butyl ether (MTBE)	44		5	ug/kg	50.0		88.6	70-130		
Carbon Disulfide	48		5	ug/kg	50.0		96.2	50-150		
Carbon Tetrachloride	38		5	ug/kg	50.0		76.4	70-130		
Chlorobenzene	40		5	ug/kg	50.0		80.7	70-130		
Chloroethane	55		5	ug/kg	50.0		111	50-150		
Chloroform	41		5	ug/kg	50.0		81.4	70-130		
Chloromethane	53		5	ug/kg	50.0		106	50-150		
4-Chlorotoluene	39		5	ug/kg	50.0		78.7	70-130		
2-Chlorotoluene	39		5	ug/kg	50.0		77.4	70-130		
1,2-Dibromo-3-chloropropane (DBCP)	42		5	ug/kg	50.0		84.1	70-130		
Dibromochloromethane	37		5	ug/kg	50.0		74.2	70-130		
1,2-Dibromoethane (EDB)	41		5	ug/kg	50.0		81.6	70-130		
Dibromomethane	42		5	ug/kg	50.0		83.7	60-140		
1,2-Dichlorobenzene	39		5	ug/kg	50.0		77.1	70-130		
1,3-Dichlorobenzene	36		5	ug/kg	50.0		71.6	70-130		
1,4-Dichlorobenzene	40		5	ug/kg	50.0		80.4	70-130		
1,1-Dichloroethane	41		5	ug/kg	50.0		82.0	70-130		
1,2-Dichloroethane	42		5	ug/kg	50.0		84.7	70-130		
trans-1,2-Dichloroethene	39		5	ug/kg	50.0		77.9	70-130		
cis-1,2-Dichloroethene	41		5	ug/kg	50.0		81.6	70-130		
1,1-Dichloroethene	40		5	ug/kg	50.0		80.7	70-130		
1,2-Dichloropropane	41		5	ug/kg	50.0		81.3	70-130		
2,2-Dichloropropane	41		5	ug/kg	50.0		82.0	70-130		
cis-1,3-Dichloropropene	39		5	ug/kg	50.0		78.0	70-130		
trans-1,3-Dichloropropene	39		5	ug/kg	50.0		78.7	70-130		
1,1-Dichloropropene	40		5	ug/kg	50.0		80.4	70-130		
Diethyl ether	47		5	ug/kg	50.0		94.9	60-140		
1,4-Dioxane	221		100	ug/kg	250		88.5	0-200		
Ethylbenzene	40		5	ug/kg	50.0		79.9	70-130		
Hexachlorobutadiene	36		5	ug/kg	50.0		72.1	70-130		
2-Hexanone	49		5	ug/kg	50.0		98.2	50-150		
Isopropylbenzene	39		5	ug/kg	50.0		78.6	70-130		
p-Isopropyltoluene	40		5	ug/kg	50.0		79.4	70-130		
Methylene Chloride	35		5	ug/kg	50.0		70.9	60-140		
4-Methyl-2-pentanone	48		5	ug/kg	50.0		95.4	50-150		
Naphthalene	43		5	ug/kg	50.0		86.7	70-130		
n-Propylbenzene	41		5	ug/kg	50.0		81.7	70-130		
Styrene	38		5	ug/kg	50.0		76.8	70-130		
1,1,1,2-Tetrachloroethane	37		5	ug/kg	50.0		73.2	70-130		
Tetrachloroethene	39		5	ug/kg	50.0		77.6	70-130		
Tetrahydrofuran	52		5	ug/kg	50.0		104	50-150		
Toluene	40		5	ug/kg	50.0		80.6	70-130		
1,2,4-Trichlorobenzene	39		5	ug/kg	50.0		78.0	70-130		
1,2,3-Trichlorobenzene	40		5	ug/kg	50.0		79.6	70-130		
1,1,2-Trichloroethane	43		5	ug/kg	50.0		86.5	70-130		

Quality Control
(Continued)

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4E1182 - EPA 5035 (Continued)										
LCS (B4E1182-BS1)					Prepared & Analyzed: 05/28/24					
1,1,1-Trichloroethane	41		5	ug/kg	50.0		81.2	70-130		
Trichloroethene	41		5	ug/kg	50.0		82.5	70-130		
1,2,3-Trichloropropane	42		5	ug/kg	50.0		84.2	70-130		
1,3,5-Trimethylbenzene	39		5	ug/kg	50.0		78.8	70-130		
1,2,4-Trimethylbenzene	39		5	ug/kg	50.0		77.9	70-130		
Vinyl Chloride	58		5	ug/kg	50.0		115	50-150		
o-Xylene	38		5	ug/kg	50.0		75.4	70-130		
m&p-Xylene	76		10	ug/kg	100		75.7	70-130		
1,1,2,2-Tetrachloroethane	40		5	ug/kg	50.0		80.2	70-130		
tert-Amyl methyl ether	46		5	ug/kg	50.0		91.7	70-130		
1,3-Dichloropropane	41		5	ug/kg	50.0		81.4	70-130		
Ethyl tert-butyl ether	46		5	ug/kg	50.0		91.8	70-130		
Trichlorofluoromethane	56		5	ug/kg	50.0		113	50-150		
Dichlorodifluoromethane	51		5	ug/kg	50.0		103	50-150		
Surrogate: 4-Bromofluorobenzene			*50.5*	ug/kg	*50.0*		*101*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4			*51.3*	ug/kg	*50.0*		*103*	*70-130*		
Surrogate: Toluene-d8			*50.7*	ug/kg	*50.0*		*101*	*70-130*		
LCS Dup (B4E1182-BSD1)					Prepared & Analyzed: 05/28/24					
Acetone	59		5	ug/kg	50.0		118	50-150	4.70	30
Benzene	40		5	ug/kg	50.0		79.9	70-130	1.17	20
Bromobenzene	37		5	ug/kg	50.0		73.9	70-130	3.12	20
Bromochloromethane	37		5	ug/kg	50.0		74.7	70-130	8.29	20
Bromodichloromethane	38		5	ug/kg	50.0		76.6	70-130	2.50	20
Bromoform	34		5	ug/kg	50.0		68.7	70-130	2.24	20
Bromomethane	54		5	ug/kg	50.0		109	50-150	5.13	30
2-Butanone	50		5	ug/kg	50.0		100	50-150	7.58	30
tert-Butyl alcohol	67		5	ug/kg	50.0		133	70-130	13.0	20
sec-Butylbenzene	40		5	ug/kg	50.0		79.1	70-130	0.580	20
n-Butylbenzene	45		5	ug/kg	50.0		89.6	70-130	1.03	20
tert-Butylbenzene	36		5	ug/kg	50.0		72.1	70-130	0.250	20
Methyl t-butyl ether (MTBE)	43		5	ug/kg	50.0		87.0	70-130	1.87	20
Carbon Disulfide	48		5	ug/kg	50.0		95.0	50-150	1.21	40
Carbon Tetrachloride	38		5	ug/kg	50.0		75.5	70-130	1.24	20
Chlorobenzene	40		5	ug/kg	50.0		79.2	70-130	1.78	20
Chloroethane	53		5	ug/kg	50.0		105	50-150	4.99	30
Chloroform	41		5	ug/kg	50.0		81.4	70-130	0.0246	20
Chloromethane	53		5	ug/kg	50.0		106	50-150	0.340	30
4-Chlorotoluene	39		5	ug/kg	50.0		78.4	70-130	0.407	20
2-Chlorotoluene	38		5	ug/kg	50.0		76.1	70-130	1.72	20
1,2-Dibromo-3-chloropropane (DBCP)	40		5	ug/kg	50.0		80.0	70-130	4.90	20
Dibromochloromethane	37		5	ug/kg	50.0		73.3	70-130	1.14	20
1,2-Dibromoethane (EDB)	40		5	ug/kg	50.0		80.1	70-130	1.88	20
Dibromomethane	40		5	ug/kg	50.0		80.3	60-140	4.15	30
1,2-Dichlorobenzene	39		5	ug/kg	50.0		77.1	70-130	0.0260	20
1,3-Dichlorobenzene	35		5	ug/kg	50.0		70.2	70-130	1.95	20
1,4-Dichlorobenzene	40		5	ug/kg	50.0		80.7	70-130	0.323	20
1,1-Dichloroethane	41		5	ug/kg	50.0		81.2	70-130	0.956	20
1,2-Dichloroethane	41		5	ug/kg	50.0		82.4	70-130	2.68	20
trans-1,2-Dichloroethene	37		5	ug/kg	50.0		73.8	70-130	5.43	20
cis-1,2-Dichloroethene	39		5	ug/kg	50.0		78.2	70-130	4.23	20
1,1-Dichloroethene	39		5	ug/kg	50.0		77.3	70-130	4.30	20
1,2-Dichloropropane	40		5	ug/kg	50.0		80.3	70-130	1.24	20
2,2-Dichloropropane	40		5	ug/kg	50.0		79.5	70-130	3.14	20
cis-1,3-Dichloropropene	39		5	ug/kg	50.0		77.7	70-130	0.360	20
trans-1,3-Dichloropropene	39		5	ug/kg	50.0		77.9	70-130	1.05	20
1,1-Dichloropropene	39		5	ug/kg	50.0		78.5	70-130	2.39	20

Volatile Organic Compounds 8260C (5035-LL) (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4E1182 - EPA 5035 (Continued)										
LCS Dup (B4E1182-BSD1)					Prepared & Analyzed: 05/28/24					
Diethyl ether	47		5	ug/kg	50.0		94.1	60-140	0.868	30
1,4-Dioxane	216		100	ug/kg	250		86.6	0-200	2.18	50
Ethylbenzene	39		5	ug/kg	50.0		78.0	70-130	2.38	20
Hexachlorobutadiene	35		5	ug/kg	50.0		70.7	70-130	1.99	20
2-Hexanone	46		5	ug/kg	50.0		92.1	50-150	6.37	20
Isopropylbenzene	38		5	ug/kg	50.0		76.6	70-130	2.60	20
p-Isopropyltoluene	39		5	ug/kg	50.0		78.3	70-130	1.47	20
Methylene Chloride	39		5	ug/kg	50.0		77.6	60-140	8.99	30
4-Methyl-2-pentanone	48		5	ug/kg	50.0		95.9	50-150	0.586	20
Naphthalene	42		5	ug/kg	50.0		84.6	70-130	2.55	20
n-Propylbenzene	40		5	ug/kg	50.0		80.4	70-130	1.65	20
Styrene	38		5	ug/kg	50.0		75.2	70-130	2.13	20
1,1,1,2-Tetrachloroethane	36		5	ug/kg	50.0		71.6	70-130	2.18	20
Tetrachloroethene	39		5	ug/kg	50.0		78.2	70-130	0.847	20
Tetrahydrofuran	51		5	ug/kg	50.0		103	50-150	1.64	40
Toluene	40		5	ug/kg	50.0		79.7	70-130	1.12	20
1,2,4-Trichlorobenzene	39		5	ug/kg	50.0		77.2	70-130	1.08	20
1,2,3-Trichlorobenzene	39		5	ug/kg	50.0		77.4	70-130	2.80	20
1,1,2-Trichloroethane	38		5	ug/kg	50.0		75.2	70-130	14.0	20
1,1,1-Trichloroethane	40		5	ug/kg	50.0		80.5	70-130	0.891	20
Trichloroethene	42		5	ug/kg	50.0		83.5	70-130	1.18	20
1,2,3-Trichloropropane	41		5	ug/kg	50.0		81.9	70-130	2.77	20
1,3,5-Trimethylbenzene	38		5	ug/kg	50.0		76.6	70-130	2.78	20
1,2,4-Trimethylbenzene	38		5	ug/kg	50.0		76.8	70-130	1.42	20
Vinyl Chloride	57		5	ug/kg	50.0		114	50-150	1.35	30
o-Xylene	37		5	ug/kg	50.0		74.8	70-130	0.719	20
m&p-Xylene	74		10	ug/kg	100		74.5	70-130	1.62	20
1,1,2,2-Tetrachloroethane	39		5	ug/kg	50.0		77.9	70-130	2.91	20
tert-Amyl methyl ether	45		5	ug/kg	50.0		90.7	70-130	1.07	20
1,3-Dichloropropane	41		5	ug/kg	50.0		81.8	70-130	0.515	20
Ethyl tert-butyl ether	46		5	ug/kg	50.0		91.0	70-130	0.875	20
Trichlorofluoromethane	56		5	ug/kg	50.0		111	50-150	1.52	20
Dichlorodifluoromethane	52		5	ug/kg	50.0		104	50-150	1.28	30
Surrogate: 4-Bromofluorobenzene			*50.2*	ug/kg	*50.0*		*100*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4			*50.4*	ug/kg	*50.0*		*101*	*70-130*		
Surrogate: Toluene-d8			*50.4*	ug/kg	*50.0*		*101*	*70-130*		

Semivolatile organic compounds

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4E0994 - 1_Semivolatiles Extractions										
Blank (B4E0994-BLK1)					Prepared: 05/23/24 Analyzed: 05/24/24					
1,2,4-Trichlorobenzene	ND		130	ug/kg						
1,2-Dichlorobenzene	ND		130	ug/kg						
1,3-Dichlorobenzene	ND		130	ug/kg						
1,4-Dichlorobenzene	ND		130	ug/kg						
Phenol	ND		130	ug/kg						
2,4,5-Trichlorophenol	ND		130	ug/kg						
2,4,6-Trichlorophenol	ND		130	ug/kg						
2,4-Dichlorophenol	ND		130	ug/kg						
2,4-Dimethylphenol	ND		330	ug/kg						
2,4-Dinitrophenol	ND		330	ug/kg						
2,4-Dinitrotoluene	ND		130	ug/kg						
2,6-Dinitrotoluene	ND		130	ug/kg						
2-Chloronaphthalene	ND		130	ug/kg						
2-Chlorophenol	ND		130	ug/kg						
2-Methylnaphthalene	ND		130	ug/kg						
Nitrobenzene	ND		130	ug/kg						
2-Methylphenol	ND		130	ug/kg						
2-Nitroaniline	ND		130	ug/kg						
2-Nitrophenol	ND		330	ug/kg						
3,3'-Dichlorobenzidine	ND		330	ug/kg						
3-Nitroaniline	ND		130	ug/kg						
4,6-Dinitro-2-methylphenol	ND		330	ug/kg						
4-Bromophenyl phenyl ether	ND		130	ug/kg						
4-Chloro-3-methylphenol	ND		130	ug/kg						
4-Chloroaniline	ND		130	ug/kg						
4-Chlorophenyl phenyl ether	ND		130	ug/kg						
4-Nitroaniline	ND		130	ug/kg						
4-Nitrophenol	ND		330	ug/kg						
Acenaphthene	ND		130	ug/kg						
Acenaphthylene	ND		130	ug/kg						
Aniline	ND		130	ug/kg						
Anthracene	ND		130	ug/kg						
Benzo(a)anthracene	ND		130	ug/kg						
Benzo(a)pyrene	ND		130	ug/kg						
Benzo(b)fluoranthene	ND		130	ug/kg						
Benzo(g,h,i)perylene	ND		130	ug/kg						
Benzo(k)fluoranthene	ND		130	ug/kg						
Benzoic acid	ND		1000	ug/kg						
Biphenyl	ND		20	ug/kg						
Bis(2-chloroethoxy)methane	ND		130	ug/kg						
Bis(2-chloroethyl)ether	ND		130	ug/kg						
Bis(2-chloroisopropyl)ether	ND		130	ug/kg						
Bis(2-ethylhexyl)phthalate	ND		400	ug/kg						
Butyl benzyl phthalate	ND		130	ug/kg						
Chrysene	ND		130	ug/kg						
Di-n-octyl phthalate	ND		200	ug/kg						
Dibenz(a,h)anthracene	ND		130	ug/kg						
Dibenzofuran	ND		130	ug/kg						
Diethyl phthalate	ND		130	ug/kg						
Dimethyl phthalate	ND		330	ug/kg						
Di-n-butyl phthalate	ND		200	ug/kg						
Fluoranthene	ND		130	ug/kg						
Fluorene	ND		130	ug/kg						
Hexachlorobenzene	ND		130	ug/kg						
Hexachlorobutadiene	ND		130	ug/kg						
Hexachlorocyclopentadiene	ND		330	ug/kg						
Hexachloroethane	ND		130	ug/kg						

Semivolatile organic compounds (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4E0994 - 1_Semivolatiles Extractions (Continued)										
Blank (B4E0994-BLK1)					Prepared: 05/23/24 Analyzed: 05/24/24					
Indeno(1,2,3-cd)pyrene	ND		130	ug/kg						
Isophorone	ND		130	ug/kg						
Naphthalene	ND		130	ug/kg						
N-Nitrosodimethylamine	ND		130	ug/kg						
N-Nitrosodi-n-propylamine	ND		130	ug/kg						
N-Nitrosodiphenylamine	ND		130	ug/kg						
Pentachlorophenol	ND		330	ug/kg						
Phenanthrene	ND		130	ug/kg						
Pyrene	ND		130	ug/kg						
m&p-Cresol	ND		260	ug/kg						
Pyridine	ND		130	ug/kg						
Azobenzene	ND		130	ug/kg						
Total Dichlorobenzene	ND		130	ug/kg						
Surrogate: Nitrobenzene-d5			*2530*	ug/kg	*3330*		*75.9*	*30-126*		
Surrogate: p-Terphenyl-d14			*3830*	ug/kg	*3330*		*115*	*47-130*		
Surrogate: 2-Fluorobiphenyl			*2940*	ug/kg	*3330*		*88.3*	*34-130*		
Surrogate: Phenol-d6			*2170*	ug/kg	*3330*		*65.1*	*30-130*		
Surrogate: 2,4,6-Tribromophenol			*2040*	ug/kg	*3330*		*61.2*	*30-130*		
Surrogate: 2-Fluorophenol			*2100*	ug/kg	*3330*		*62.9*	*30-130*		
LCS (B4E0994-BS1)					Prepared: 05/23/24 Analyzed: 05/24/24					
1,2,4-Trichlorobenzene	2140		130	ug/kg	3330		64.1	40-130		
1,2-Dichlorobenzene	2320		130	ug/kg	3330		69.7	40-130		
1,3-Dichlorobenzene	2100		130	ug/kg	3330		63.0	40-130		
1,4-Dichlorobenzene	2170		130	ug/kg	3330		65.0	40-130		
Phenol	2100		130	ug/kg	3330		63.0	40-130		
2,4,5-Trichlorophenol	2010		130	ug/kg	3330		60.4	40-130		
2,4,6-Trichlorophenol	2090		130	ug/kg	3330		62.6	40-130		
2,4-Dichlorophenol	1910		130	ug/kg	3330		57.2	40-130		
2,4-Dimethylphenol	1710		330	ug/kg	3330		51.2	40-130		
2,4-Dinitrophenol	638		330	ug/kg	3330		19.1	15-140		
2,4-Dinitrotoluene	3040		130	ug/kg	3330		91.2	40-130		
2,6-Dinitrotoluene	2700		130	ug/kg	3330		80.9	40-130		
2-Chloronaphthalene	2450		130	ug/kg	3330		73.4	40-130		
2-Chlorophenol	2090		130	ug/kg	3330		62.7	40-130		
2-Methylnaphthalene	2530		130	ug/kg	3330		75.9	40-130		
Nitrobenzene	2210		130	ug/kg	3330		66.4	40-130		
2-Methylphenol	2360		130	ug/kg	3330		70.8	40-130		
2-Nitroaniline	2530		130	ug/kg	3330		76.0	40-130		
2-Nitrophenol	2020		330	ug/kg	3330		60.6	40-130		
3-Nitroaniline	2380		130	ug/kg	3330		71.5	40-130		
4,6-Dinitro-2-methylphenol	1380		330	ug/kg	3330		41.5	30-130		
4-Bromophenyl phenyl ether	2150		130	ug/kg	3330		64.5	40-130		
4-Chloro-3-methylphenol	2120		130	ug/kg	3330		63.5	40-130		
4-Chlorophenyl phenyl ether	3080		130	ug/kg	3330		92.5	40-130		
4-Nitroaniline	2290		130	ug/kg	3330		68.7	40-130		
4-Nitrophenol	4010		330	ug/kg	3330		120	40-130		
Acenaphthene	2420		130	ug/kg	3330		72.6	40-130		
Acenaphthylene	2750		130	ug/kg	3330		82.5	40-130		
Anthracene	2500		130	ug/kg	3330		75.0	40-130		
Benzo(a)anthracene	2790		130	ug/kg	3330		83.7	40-130		
Benzo(a)pyrene	3220		130	ug/kg	3330		96.5	40-130		
Benzo(b)fluoranthene	3310		130	ug/kg	3330		99.3	40-130		
Benzo(g,h,i)perylene	2550		130	ug/kg	3330		76.6	40-130		
Benzo(k)fluoranthene	3380		130	ug/kg	3330		101	40-130		
Biphenyl	517		20	ug/kg	833		62.1	40-130		
Bis(2-chloroethoxy)methane	1900		130	ug/kg	3330		57.0	40-130		

Semivolatile organic compounds (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4E0994 - 1_Semivolatiles Extractions (Continued)										
LCS (B4E0994-BS1)					Prepared: 05/23/24 Analyzed: 05/24/24					
Bis(2-chloroethyl)ether	2040		130	ug/kg	3330		61.2	40-130		
Bis(2-chloroisopropyl)ether	1810		130	ug/kg	3330		54.3	40-130		
Bis(2-ethylhexyl)phthalate	3280		400	ug/kg	3330		98.4	40-130		
Butyl benzyl phthalate	3320		130	ug/kg	3330		99.5	40-130		
Chrysene	2760		130	ug/kg	3330		82.8	40-130		
Di-n-octyl phthalate	4660		200	ug/kg	3330		140	40-130		
Dibenz(a,h)anthracene	2730		130	ug/kg	3330		82.0	40-130		
Dibenzofuran	2870		130	ug/kg	3330		86.2	40-130		
Diethyl phthalate	3090		130	ug/kg	3330		92.7	40-130		
Dimethyl phthalate	2690		330	ug/kg	3330		80.8	40-130		
Di-n-butyl phthalate	2970		200	ug/kg	3330		89.0	40-130		
Fluoranthene	2520		130	ug/kg	3330		75.5	40-130		
Fluorene	3050		130	ug/kg	3330		91.5	40-130		
Hexachlorobenzene	2150		130	ug/kg	3330		64.4	40-130		
Hexachlorobutadiene	2420		130	ug/kg	3330		72.5	40-130		
Hexachlorocyclopentadiene	1700		330	ug/kg	3330		51.0	40-130		
Hexachloroethane	2590		130	ug/kg	3330		77.6	40-130		
Indeno(1,2,3-cd)pyrene	3050		130	ug/kg	3330		91.5	40-130		
Isophorone	2260		130	ug/kg	3330		67.9	40-130		
Naphthalene	2330		130	ug/kg	3330		69.8	40-130		
N-Nitrosodimethylamine	2280		130	ug/kg	3330		68.5	40-130		
N-Nitrosodi-n-propylamine	2170		130	ug/kg	3330		65.1	40-130		
N-Nitrosodiphenylamine	2920		130	ug/kg	3330		87.7	40-130		
Pentachlorophenol	987		330	ug/kg	3330		29.6	15-140		
Phenanthrene	2480		130	ug/kg	3330		74.5	40-130		
Pyrene	2970		130	ug/kg	3330		89.1	40-130		
m&p-Cresol	2040		260	ug/kg	3330		61.1	40-130		
Surrogate: Nitrobenzene-d5			*2480*	ug/kg	*3330*		*74.3*	*30-126*		
Surrogate: p-Terphenyl-d14			*3650*	ug/kg	*3330*		*110*	*47-130*		
Surrogate: 2-Fluorobiphenyl			*3070*	ug/kg	*3330*		*92.1*	*34-130*		
Surrogate: Phenol-d6			*2220*	ug/kg	*3330*		*66.7*	*30-130*		
Surrogate: 2,4,6-Tribromophenol			*2740*	ug/kg	*3330*		*82.2*	*30-130*		
Surrogate: 2-Fluorophenol			*2190*	ug/kg	*3330*		*65.8*	*30-130*		

Semivolatile organic compounds (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4E0994 - 1_Semivolatiles Extractions (Continued)										
LCS Dup (B4E0994-BSD1)					Prepared: 05/23/24 Analyzed: 05/24/24					
1,2,4-Trichlorobenzene	2100		130	ug/kg	3330		63.0	40-130	1.67	30
1,2-Dichlorobenzene	2090		130	ug/kg	3330		62.8	40-130	10.4	30
1,3-Dichlorobenzene	1970		130	ug/kg	3330		59.2	40-130	6.25	30
1,4-Dichlorobenzene	2030		130	ug/kg	3330		60.9	40-130	6.51	30
Phenol	1920		130	ug/kg	3330		57.7	40-130	8.75	30
2,4,5-Trichlorophenol	1840		130	ug/kg	3330		55.3	40-130	8.71	30
2,4,6-Trichlorophenol	1890		130	ug/kg	3330		56.7	40-130	9.89	30
2,4-Dichlorophenol	1880		130	ug/kg	3330		56.4	40-130	1.41	30
2,4-Dimethylphenol	1550		330	ug/kg	3330		46.6	40-130	9.24	30
2,4-Dinitrophenol	677		330	ug/kg	3330		20.3	15-140	5.98	30
2,4-Dinitrotoluene	2850		130	ug/kg	3330		85.6	40-130	6.40	30
2,6-Dinitrotoluene	2380		130	ug/kg	3330		71.4	40-130	12.4	30
2-Chloronaphthalene	2300		130	ug/kg	3330		69.1	40-130	6.04	30
2-Chlorophenol	1980		130	ug/kg	3330		59.4	40-130	5.34	30
2-Methylnaphthalene	2340		130	ug/kg	3330		70.2	40-130	7.83	30
Nitrobenzene	2140		130	ug/kg	3330		64.2	40-130	3.37	30
2-Methylphenol	2240		130	ug/kg	3330		67.2	40-130	5.21	30
2-Nitroaniline	2460		130	ug/kg	3330		73.9	40-130	2.77	30
2-Nitrophenol	2030		330	ug/kg	3330		60.9	40-130	0.527	30
3-Nitroaniline	2140		130	ug/kg	3330		64.3	40-130	10.6	30
4,6-Dinitro-2-methylphenol	1330		330	ug/kg	3330		39.8	30-130	4.18	30
4-Bromophenyl phenyl ether	2060		130	ug/kg	3330		61.9	40-130	4.08	30
4-Chloro-3-methylphenol	2000		130	ug/kg	3330		59.9	40-130	5.90	30
4-Chlorophenyl phenyl ether	2880		130	ug/kg	3330		86.3	40-130	6.89	30
4-Nitroaniline	2100		130	ug/kg	3330		63.0	40-130	8.65	30
4-Nitrophenol	3640		330	ug/kg	3330		109	40-130	9.62	30
Acenaphthene	2190		130	ug/kg	3330		65.7	40-130	9.95	30
Acenaphthylene	2500		130	ug/kg	3330		75.0	40-130	9.55	30
Anthracene	2410		130	ug/kg	3330		72.3	40-130	3.58	30
Benzo(a)anthracene	2620		130	ug/kg	3330		78.7	40-130	6.16	30
Benzo(a)pyrene	2940		130	ug/kg	3330		88.1	40-130	9.10	30
Benzo(b)fluoranthene	3100		130	ug/kg	3330		92.9	40-130	6.64	30
Benzo(g,h,i)perylene	2350		130	ug/kg	3330		70.4	40-130	8.38	30
Benzo(k)fluoranthene	3110		130	ug/kg	3330		93.3	40-130	8.40	30
Biphenyl	505		20	ug/kg	833		60.6	40-130	2.48	30
Bis(2-chloroethoxy)methane	1850		130	ug/kg	3330		55.6	40-130	2.52	30
Bis(2-chloroethyl)ether	1880		130	ug/kg	3330		56.3	40-130	8.34	30
Bis(2-chloroisopropyl)ether	1620		130	ug/kg	3330		48.5	40-130	11.2	30
Bis(2-ethylhexyl)phthalate	3100		400	ug/kg	3330		92.9	40-130	5.75	30
Butyl benzyl phthalate	3090		130	ug/kg	3330		92.8	40-130	6.99	30
Chrysene	2630		130	ug/kg	3330		78.9	40-130	4.72	30
Di-n-octyl phthalate	4290		200	ug/kg	3330		129	40-130	8.32	30
Dibenz(a,h)anthracene	2510		130	ug/kg	3330		75.4	40-130	8.39	30
Dibenzofuran	2680		130	ug/kg	3330		80.4	40-130	6.99	30
Diethyl phthalate	2850		130	ug/kg	3330		85.6	40-130	7.96	30
Dimethyl phthalate	2540		330	ug/kg	3330		76.2	40-130	5.84	30
Di-n-butyl phthalate	2770		200	ug/kg	3330		83.2	40-130	6.73	30
Fluoranthene	2380		130	ug/kg	3330		71.3	40-130	5.70	30
Fluorene	2920		130	ug/kg	3330		87.7	40-130	4.29	30
Hexachlorobenzene	2000		130	ug/kg	3330		60.1	40-130	6.88	30
Hexachlorobutadiene	2270		130	ug/kg	3330		68.0	40-130	6.40	30
Hexachlorocyclopentadiene	1560		330	ug/kg	3330		46.7	40-130	8.81	30
Hexachloroethane	2330		130	ug/kg	3330		70.0	40-130	10.3	30
Indeno(1,2,3-cd)pyrene	2770		130	ug/kg	3330		83.2	40-130	9.41	30
Isophorone	2140		130	ug/kg	3330		64.3	40-130	5.39	30
Naphthalene	2220		130	ug/kg	3330		66.6	40-130	4.60	30
N-Nitrosodimethylamine	2190		130	ug/kg	3330		65.7	40-130	[illegible]	[illegible]

Quality Control
(Continued)

Semivolatile organic compounds (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4E0994 - 1_Semivolatiles Extractions (Continued)										
LCS Dup (B4E0994-BSD1)					Prepared: 05/23/24 Analyzed: 05/24/24					
N-Nitrosodi-n-propylamine	2040		130	ug/kg	3330		61.2	40-130	6.14	30
N-Nitrosodiphenylamine	2750		130	ug/kg	3330		82.6	40-130	6.01	30
Pentachlorophenol	935		330	ug/kg	3330		28.0	15-140	5.41	30
Phenanthrene	2310		130	ug/kg	3330		69.4	40-130	7.15	30
Pyrene	2760		130	ug/kg	3330		82.8	40-130	7.26	30
m&p-Cresol	1790		260	ug/kg	3330		53.7	40-130	12.9	30
Surrogate: Nitrobenzene-d5			*2430*	ug/kg	*3330*		*73.0*	*30-126*		
Surrogate: p-Terphenyl-d14			*3410*	ug/kg	*3330*		*102*	*47-130*		
Surrogate: 2-Fluorobiphenyl			*2860*	ug/kg	*3330*		*85.7*	*34-130*		
Surrogate: Phenol-d6			*2020*	ug/kg	*3330*		*60.7*	*30-130*		
Surrogate: 2,4,6-Tribromophenol			*2560*	ug/kg	*3330*		*76.9*	*30-130*		
Surrogate: 2-Fluorophenol			*2680*	ug/kg	*3330*		*80.4*	*30-130*		

Quality Control
(Continued)

Polychlorinated Biphenyls (PCBs)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4E0961 - 1_Semivolatiles Extractions										
Blank (B4E0961-BLK1)					Prepared: 05/22/24 Analyzed: 05/23/24					
Aroclor-1016	ND		66	ug/kg						
Aroclor-1221	ND		66	ug/kg						
Aroclor-1232	ND		66	ug/kg						
Aroclor-1242	ND		66	ug/kg						
Aroclor-1248	ND		66	ug/kg						
Aroclor-1254	ND		66	ug/kg						
Aroclor-1260	ND		66	ug/kg						
Aroclor-1262	ND		66	ug/kg						
Aroclor-1268	ND		66	ug/kg						
PCBs (Total)	ND		66	ug/kg						
Surrogate: 2,4,5,6-Tetrachloro-m-xylene (TCMX)			*13.7*	ug/kg	*26.7*		*51.4*	*36.2-130*		
Surrogate: Decachlorobiphenyl (DCBP)			*21.6*	ug/kg	*26.7*		*80.8*	*43.3-130*		
LCS (B4E0961-BS1)					Prepared: 05/22/24 Analyzed: 05/23/24					
Aroclor-1016	185		66	ug/kg	167		111	58.2-125		
Aroclor-1260	201		66	ug/kg	167		121	65.5-130		
Surrogate: 2,4,5,6-Tetrachloro-m-xylene (TCMX)			*14.2*	ug/kg	*26.7*		*53.2*	*36.2-130*		
Surrogate: Decachlorobiphenyl (DCBP)			*21.5*	ug/kg	*26.7*		*80.5*	*43.3-130*		
LCS Dup (B4E0961-BSD1)					Prepared: 05/22/24 Analyzed: 05/23/24					
Aroclor-1016	177		66	ug/kg	167		106	58.2-125	4.03	20
Aroclor-1260	207		66	ug/kg	167		124	65.5-130	2.74	20
Surrogate: 2,4,5,6-Tetrachloro-m-xylene (TCMX)			*15.2*	ug/kg	*26.7*		*57.0*	*36.2-130*		
Surrogate: Decachlorobiphenyl (DCBP)			*22.4*	ug/kg	*26.7*		*84.1*	*43.3-130*		

Quality Control
(Continued)

Total Petroleum Hydrocarbons

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B4E1000 - 1_Semivolatiles Extractions										
Blank (B4E1000-BLK1)					Prepared: 05/23/24 Analyzed: 05/28/24					
Total Petroleum Hydrocarbons	ND		27	mg/kg						
Surrogate: Chlorooctadecane			*5.28*	mg/kg	*8.33*		*63.3*	*50-130*		
LCS (B4E1000-BS1)					Prepared: 05/23/24 Analyzed: 05/28/24					
Total Petroleum Hydrocarbons	349		27	mg/kg	667		52.4	44.7-125		
Surrogate: Chlorooctadecane			*6.05*	mg/kg	*8.33*		*72.6*	*50-130*		
LCS Dup (B4E1000-BSD1)					Prepared: 05/23/24 Analyzed: 05/28/24					
Total Petroleum Hydrocarbons	431		27	mg/kg	667		64.7	44.7-125	21.0	30
Surrogate: Chlorooctadecane			*7.42*	mg/kg	*8.33*		*89.1*	*50-130*		

Notes and Definitions

Item	Definition
E	Over Cal
Wet	Sample results reported on a wet weight basis.
ND	Analyte NOT DETECTED at or above the reporting limit.
RPD	Relative Percent Difference.
%REC	Percent Recovery.
Source	Sample that was matrix spiked or duplicated.

NEW ENGLAND TESTING LABORATORY, I
59 Greenhill Street
West Warwick, RI 02893
1-888-863-8522

4 E 2 1013 W

PROJ. NO. 2585

PROJECT NAME/LOCATION: Town of Wilmington Property
146 Middlesex Ave Wilmington, MA 01887

CLIENT: Capital Environmental LLC
46 Washburn St Northboro MA 01532

REPORT TO: Rob@Capital-Enviro.com

INVOICE TO: Rob@Capital-Enviro.com

DATE	TIME	COMP	GRAB	SAMPLE I.D.	AQUEOUS	SOIL	OTHER	NO. OF CONTAINERS	PRESERVATIVE	TESTS** TPH 8100M, PCBs, Metals 14	Flash pt, Corrosivity	PCBs, Filter SVOC, Reactivity	Conductivity only wt. CN's	Low level VOC's	REMARKS
5/20/24	1P	X		TP-1		X		2 GLASS	ICE	X	X	X	X		
			X	TP-1		X		1 VOA	ICE					X	Frozen
5/20/24	120P	X		TP-2		X		2 GLASS	ICE	X	X	X	X		
			X	TP-2		X		1 VOA	ICE					X	Frozen
5/20/24	140P	X		TP-3		X		2 GLASS	ICE	X	X	X	X		
			X	TP-3		X		1 VOA	ICE					X	Frozen
5/20/24	200P	X		TP-4		X		2 GLASS	ICE	X	X	X	X		
			X	TP-4		X		1 VOA	ICE					X	Frozen

use glass jars for dry wt.

Sampled by: (Signature) Rob Bey — Date/Time 5/21/24 7:00 A

Relinquished by: (Signature) R Shaw — Date/Time 5/21/24 16:50

Relinquished by: (Signature) — Date/Time

Received by: (Signature) R Shaw — Date/Time 5/21/24 10:25

Received by: (Signature) — Date/Time

Received for Laboratory by: (Signature) NH — Date/Time 5/21/24 1650

Laboratory Remarks:
Temp. received: 3
Cooled ☐

Special Instructions:
List Specific Detection Limit Requirements:

Turnaround (Business Days) 5 Day

**Netlab subcontracts the following tests: Radiologicals, Radon, Asbestos, UCMRs, Perchlorate, Bromate, Bromide, Sieve, Salmonella, Carbamates, CT ETPH

MassDEP Analytical Protocol Certification Form

Laboratory Name: New England Testing Laboratory, Inc. Project #: 2585

Project Location: Wilmington, MA RTN:

This Form provides certifications for the following data set: list Laboratory Sample ID Number(s):
4E21013

Matrices: ☐ Groundwater/Surface Water ☒ Soil/Sediment ☐ Drinking Water ☐ Air ☐ Other:

CAM Protocol (check all that apply below):

8260 VOC CAM II A ☒	7470/7471 Hg CAM III B ☒	MassDEP VPH (GC/PID/FID) CAM IV A ☐	8082 PCB CAM V A ☒	9014 Total Cyanide/PAC CAM VI A ☐	6860 Perchlorate CAM VIII B ☐
8270 SVOC CAM II B ☒	7010 Metals CAM III C ☐	MassDEP VPH (GC/MS) CAM IV C ☐	8081 Pesticides CAM V B ☐	7196 Hex Cr CAM VI B ☐	MassDEP APH CAM IX A ☐
6010 Metals CAM III A ☒	6020 Metals CAM III D ☐	MassDEP EPH CAM IV B ☐	8151 Herbicides CAM V C ☐	8330 Explosives CAM VIII A ☐	TO-15 VOC CAM IX B ☐

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	☒ Yes ☐ No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	☒ Yes ☐ No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	☒ Yes ☐ No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	☒ Yes ☐ No
E	VPH, EPH, APH, and TO-15 only a. VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	☐ Yes ☐ No ☐ Yes ☐ No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	☒ Yes ☐ No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	☒ Yes ☐ No[1]

***Data User Note*: Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.**

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	☒ Yes ☐ No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	☒ Yes ☐ No[1]

[1]*All negative responses must be addressed in an attached laboratory narrative.*

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.

Signature: _____ **Position:** Laboratory Director

Printed Name: Richard Warila **Date**: 5/31/2024

Appendix F-2 Compaction Test Results

Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	October 16, 2023
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Overcast, 40°'s °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
NONE

Arriving onsite this morning as scheduled, the undersigned found that a 50' x 50' area to the south of the in-place asphalt had been previously prepared, to finish grade elevation.

During this visit, a total of nineteen (19) nuclear moisture/density readings (tests #1 through #19) were performed. All of the results met the stated 95% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet.

Report By: Rob Witt

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
1	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	124.2	8.1	93.8	92+	Pass
2	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel/glass trace silt (L33621)	120.2	7.4	113.2	10.0	94.2	92+	Pass
3	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel/glass trace silt (L33621)	120.2	7.4	118.1	9.3	98.3	92+	Pass
4	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel/glass trace silt (L33621)	120.2	7.4	116.8	11.2	97.2	92+	Pass
5	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel/glass trace silt (L33621)	120.2	7.4	112.0	9.0	93.2	92+	Pass
6	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	124.8	8.0	94.3	92+	Pass
7	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	127.0	9.5	95.9	92+	Pass
8	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel/glass trace silt (L33621)	120.2	7.4	116.7	10.2	97.1	92+	Pass
9	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	122.8	9.7	92.7	92+	Pass
10	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel/glass trace silt (L33621)	120.2	7.4	121.6	8.6	101.2	92+	Pass
11	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel/glass trace silt (L33621)	120.2	7.4	120.8	10.6	100.5	92+	Pass
12	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	125.9	10.9	95.1	92+	Pass
13	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel/glass trace silt (L33621)	120.2	7.4	116.2	11.9	96.7	92+	Pass
14	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel/glass trace silt (L33621)	120.2	7.4	121.5	8.2	101.1	92+	Pass
15	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	127.6	8.0	96.4	92+	Pass

Soil Field Testing Notes and/or Observations	FG = Finish Grade

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
16	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel/glass trace silt (L33621)	120.2	7.4	118.3	8.0	98.4	92+	Pass
17	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel/glass trace silt (L33621)	120.2	7.4	119.7	9.6	99.6	92+	Pass
18	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel/glass trace silt (L33621)	120.2	7.4	116.2	10.8	96.7	92+	Pass
19	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	123.3	9.1	93.1	92+	Pass
20	10/18/23	See sketch	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	122.9	10.5	92.8	92+	Pass
21	10/18/23	See sketch	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	123.1	10.7	93.0	92+	Pass
22	10/18/23	See sketch	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	127.6	8.3	96.4	92+	Pass
23	10/18/23	See sketch	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	124.9	9.8	94.3	92+	Pass
24	10/18/23	See sketch	2' BFG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	125.2	12.4	94.6	92+	Pass
25	10/18/23	See sketch	2' BFG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	126.3	11.6	95.4	92+	Pass
26	10/18/23	See sketch	2' BFG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	124.5	9.6	94.0	92+	Pass

Soil Field Testing Notes and/or Observations	FG = Finish Grade
	BFG = Below Finish Grade

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D 6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	October 18, 2023
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Cloudy, 45°-65° °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
(1) Large Bulldozer (1) Large Riding Vibratory Roller

Arriving onsite this morning as scheduled, the undersigned technician met with Mr. Mike Bates, the project superintendent, who stated that compaction tests were required for a section of the site (see sketch).

A review of the work area found that the crew had; prior to my arrival, prepared the area to be tested.

During this visit, a total of seven (7) nuclear moisture/density readings (tests #20 through #26) were performed. All of the results met the stated 92% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Mr. Bates was informed of today's field observation and testing prior to my departure.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Rez Sbat

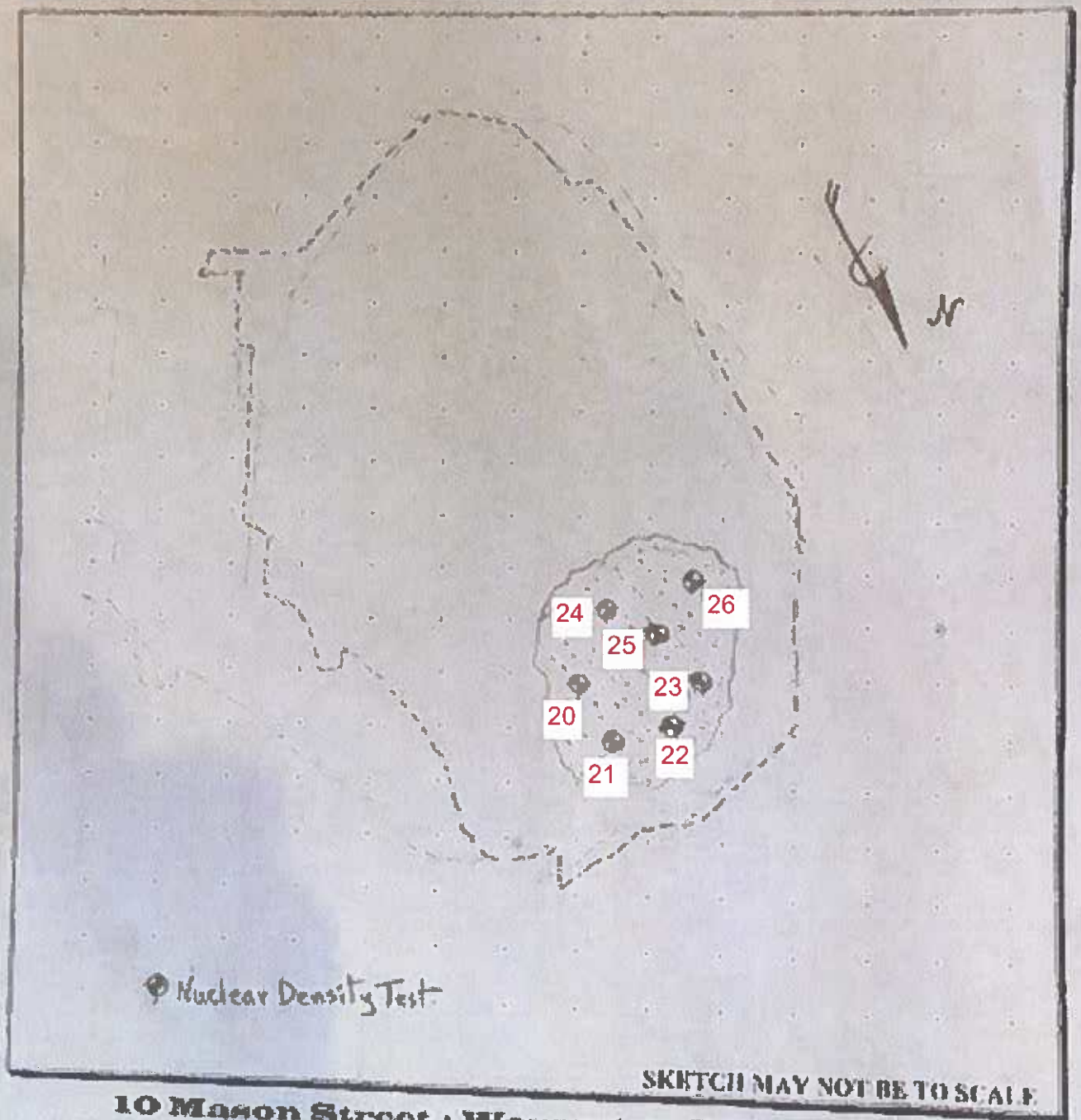
10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering & Testing, Inc.

Project Field Sketch

Project: Ledge Rd SFF Andover
Location: Andover, MA

Date: 10-18-22
Job No#: 26023



SKETCH MAY NOT BE TO SCALE

10 Mason Street · Worcester, MA · 01609
Phone (508) 831-7404 · Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	**JBS//Andover Ledge Road SLF**	**Project No#**	**26023**
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
16	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel/glass trace silt (L33621)	120.2	7.4	118.3	8.0	98.4	92+	Pass
17	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel/glass trace silt (L33621)	120.2	7.4	119.7	9.6	99.6	92+	Pass
18	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel/glass trace silt (L33621)	120.2	7.4	116.2	10.8	96.7	92+	Pass
19	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	123.3	9.1	93.1	92+	Pass
20	10/18/23	See sketch	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	122.9	10.5	92.8	92+	Pass
21	10/18/23	See sketch	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	123.1	10.7	93.0	92+	Pass
22	10/18/23	See sketch	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	127.6	8.3	96.4	92+	Pass
23	10/18/23	See sketch	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	124.9	9.8	94.3	92+	Pass
24	10/18/23	See sketch	2' BFG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	125.2	12.4	94.6	92+	Pass
25	10/18/23	See sketch	2' BFG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	126.3	11.6	95.4	92+	Pass
26	10/18/23	See sketch	2' BFG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	124.5	9.6	94.0	92+	Pass

Soil Field Testing Notes and/or Observations	FG = Finish Grade
	BFG = Below Finish Grade

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	October 23, 2023
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Sunny, 40°-60° °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
(1) Large Excavator
(1) Large Front-End Loader
(1) Large Riding Vibratory Roller

Arriving onsite this morning as scheduled, the undersigned observer met with Mr. Mike Bates, the project superintendent, and Mr. Myles Johnson, from CDM Smith, who stated that compaction tests, five (5) tests per acre, were required for a section of the site (see sketch).

A review of the work area found that the crew had; prior to my arrival, prepared the area to be tested.

During this visit, a total of twenty-two (22) nuclear moisture/density readings (tests #27 through #48) were performed. All of the results met the stated 92% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Mr. Johnson was notified of today's field observation and testing prior to my departure.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Rez Sbat

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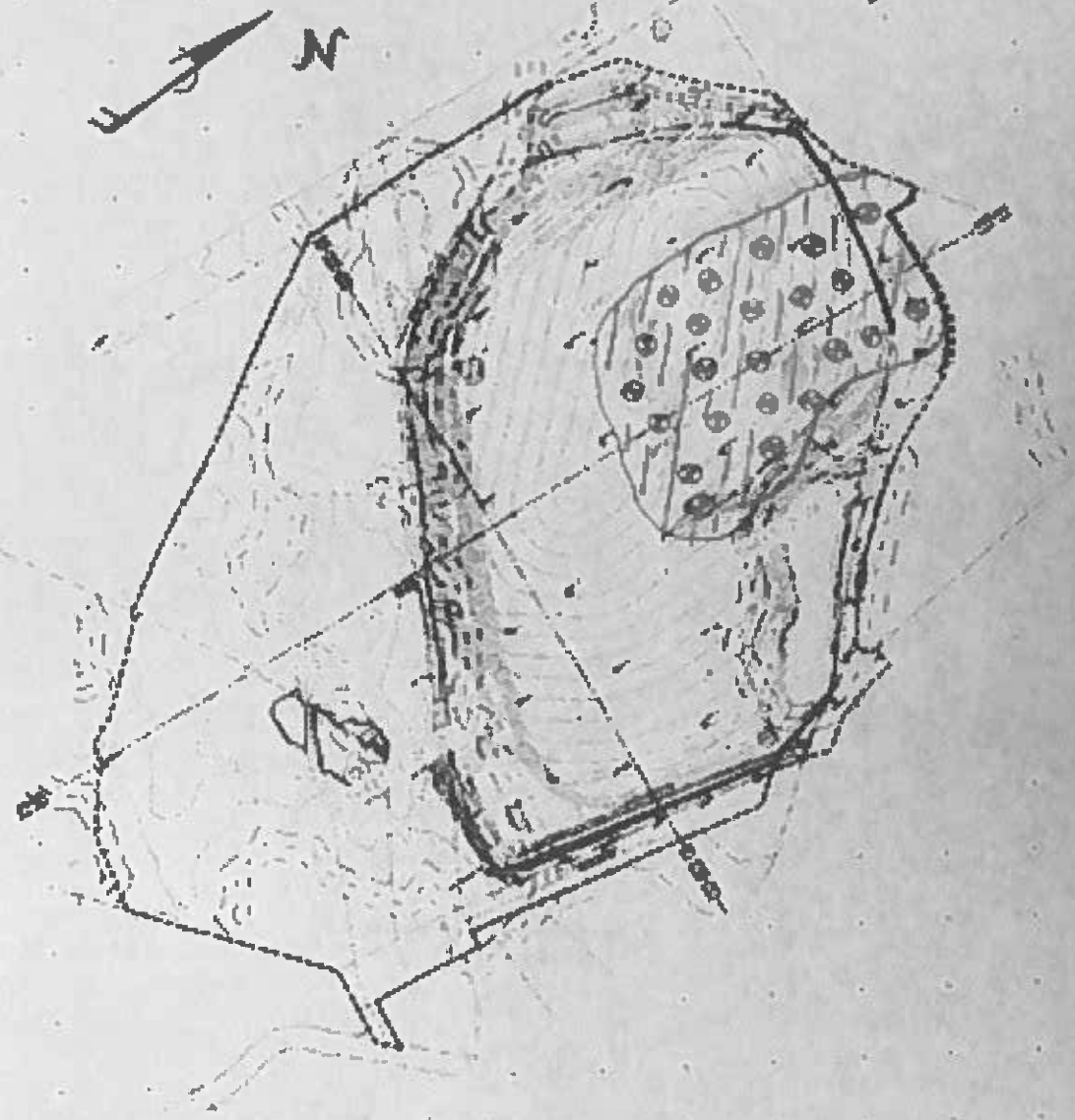
Yankee Engineering & Testing, Inc.

Project Field Sketch

Project: Large Rd SIE Andover
Location: Andover, MA

Date: 1-23-23
Job No#: 26023



SKETCH MAY NOT BE TO SCALE

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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
16	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel/glass trace silt (L33621)	120.2	7.4	118.3	8.0	98.4	92+	Pass
17	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel/glass trace silt (L33621)	120.2	7.4	119.7	9.6	99.6	92+	Pass
18	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel/glass trace silt (L33621)	120.2	7.4	116.2	10.8	96.7	92+	Pass
19	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	123.3	9.1	93.1	92+	Pass
20	10/18/23	See sketch	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	122.9	10.5	92.8	92+	Pass
21	10/18/23	See sketch	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	123.1	10.7	93.0	92+	Pass
22	10/18/23	See sketch	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	127.6	8.3	96.4	92+	Pass
23	10/18/23	See sketch	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	124.9	9.8	94.3	92+	Pass
24	10/18/23	See sketch	2' BFG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	125.2	12.4	94.6	92+	Pass
25	10/18/23	See sketch	2' BFG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	126.3	11.6	95.4	92+	Pass
26	10/18/23	See sketch	2' BFG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	124.5	9.6	94.0	92+	Pass
27	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	125.0	10.2	94.3	92+	Pass
28	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	128.5	7.4	97.0	92+	Pass
29	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	122.3	11.7	92.3	92+	Pass
30	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	126.1	8.5	95.2	92+	Pass

Soil Field Testing Notes and/or Observations	FG = Finish Grade
	BFG = Below Finish Grade

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
31	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	128.4	9.2	96.9	92+	Pass
32	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	124.5	10.1	94.0	92+	Pass
33	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	124.7	10.8	94.1	92+	Pass
34	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	123.9	9.5	93.5	92+	Pass
35	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	124.9	9.3	94.3	92+	Pass
36	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	124.7	9.6	94.1	92+	Pass
37	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	126.7	9.8	95.6	92+	Pass
38	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	124.0	10.5	93.6	92+	Pass
39	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	126.0	10.2	95.1	92+	Pass
40	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	123.6	9.8	93.3	92+	Pass
41	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	127.5	11.1	96.2	92+	Pass
42	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	123.9	9.6	93.5	92+	Pass
43	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	125.6	11.5	94.8	92+	Pass
44	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	122.7	8.9	92.6	92+	Pass
45	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	124.1	10.5	93.7	92+	Pass

Soil Field Testing Notes and/or Observations	

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	**JBS//Andover Ledge Road SLF**	**Project No#**	**26023**
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Compaction (%)	Min. Spec (%)	Pass or Fail
46	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	127.6	9.9	96.3	92+	Pass
47	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	123.5	9.6	93.2	92+	Pass
48	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	124.8	10.1	94.2	92+	Pass

Soil Field Testing Notes and/or Observations

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	October 16, 2023
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Overcast, 40°'s °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
NONE

Arriving onsite this morning as scheduled, the undersigned found that a 50' x 50' area to the south of the in-place asphalt had been previously prepared, to finish grade elevation.

During this visit, a total of nineteen (19) nuclear moisture/density readings (tests #1 through #19) were performed. All of the results met the stated 95% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet.

Report By: Rob Witt

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Compaction (%)	Min. Spec (%)	Pass or Fail
1	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	124.2	8.1	93.8	92+	Pass
2	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel/glass trace silt (L33621)	120.2	7.4	113.2	10.0	94.2	92+	Pass
3	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel/glass trace silt (L33621)	120.2	7.4	118.1	9.3	98.3	92+	Pass
4	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel/glass trace silt (L33621)	120.2	7.4	116.8	11.2	97.2	92+	Pass
5	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel/glass trace silt (L33621)	120.2	7.4	112.0	9.0	93.2	92+	Pass
6	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	124.8	8.0	94.3	92+	Pass
7	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	127.0	9.5	95.9	92+	Pass
8	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel/glass trace silt (L33621)	120.2	7.4	116.7	10.2	97.1	92+	Pass
9	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	122.8	9.7	92.7	92+	Pass
10	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel/glass trace silt (L33621)	120.2	7.4	121.6	8.6	101.2	92+	Pass
11	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel/glass trace silt (L33621)	120.2	7.4	120.8	10.6	100.5	92+	Pass
12	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	125.9	10.9	95.1	92+	Pass
13	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel/glass trace silt (L33621)	120.2	7.4	116.2	11.9	96.7	92+	Pass
14	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel/glass trace silt (L33621)	120.2	7.4	121.5	8.2	101.1	92+	Pass
15	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	127.6	8.0	96.4	92+	Pass
Soil Field Testing Notes and/or Observations		FG = Finish Grade									

Field Testing Performed using a Nuclear Moisture Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Compaction (%)	Min. Spec (%)	Pass or Fail
16	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel glass trace silt (L33621)	120.2	7.4	118.3	8.0	98.4	92+	Pass
17	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel glass trace silt (L33621)	120.2	7.4	119.7	9.6	99.6	92+	Pass
18	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel glass trace silt (L33621)	120.2	7.4	116.2	10.8	96.7	92+	Pass
19	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	123.3	9.1	93.1	92+	Pass
20	10/18/23	See sketch	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	122.9	10.5	92.8	92+	Pass
21	10/18/23	See sketch	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	123.1	10.7	93.0	92+	Pass
22	10/18/23	See sketch	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	127.6	8.3	96.4	92+	Pass
23	10/18/23	See sketch	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	124.9	9.8	94.3	92+	Pass
24	10/18/23	See sketch	2' BFG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	125.2	12.4	94.6	92+	Pass
25	10/18/23	See sketch	2' BFG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	126.3	11.6	95.4	92+	Pass
26	10/18/23	See sketch	2' BFG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	124.5	9.6	94.0	92+	Pass

Soil Field Testing Notes and/or Observations	FG = Finish Grade
	BFG = Below Finish Grade

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D 6938) Unless Otherwise Noted

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10-16

NO	DATE	DRWN	CHKD	REMARKS
3	3/3/23	JBW	MEJ	UPDATED PER COMMENTS
2	11/16/22	AAB	MEJ	REMOVED ANTI-FLOATATION SOIL/ PEM MATERIALS HANDLING AREA
1	4/28/21	JBW	MEJ	REVISED TO RESPOND TO CONSERVATION COMMISSION PEER REVIEW COMMENTS

DESIGNED BY S. HOWARD
DRAWN BY A. MCS
SHEET CHK'D BY C. JONES
CROSS CHK'D BY N. JONES
APPROVED BY M. JONES
DATE MARCH 2023

CDM Smith

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

OVERALL SITE KEY PLAN

PROJECT NO 6333-113811
FILE NAME C003KYPL.DWG
SHEET NO G-3

Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	October 18, 2023
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Cloudy, 45°-65° °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
(1) Large Bulldozer (1) Large Riding Vibratory Roller

Arriving onsite this morning as scheduled, the undersigned technician met with Mr. Mike Bates, the project superintendent, who stated that compaction tests were required for a section of the site (see sketch).

A review of the work area found that the crew had; prior to my arrival, prepared the area to be tested.

During this visit, a total of seven (7) nuclear moisture/density readings (tests #20 through #26) were performed. All of the results met the stated 92% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Mr. Bates was informed of today's field observation and testing prior to my departure.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Rez Sbat

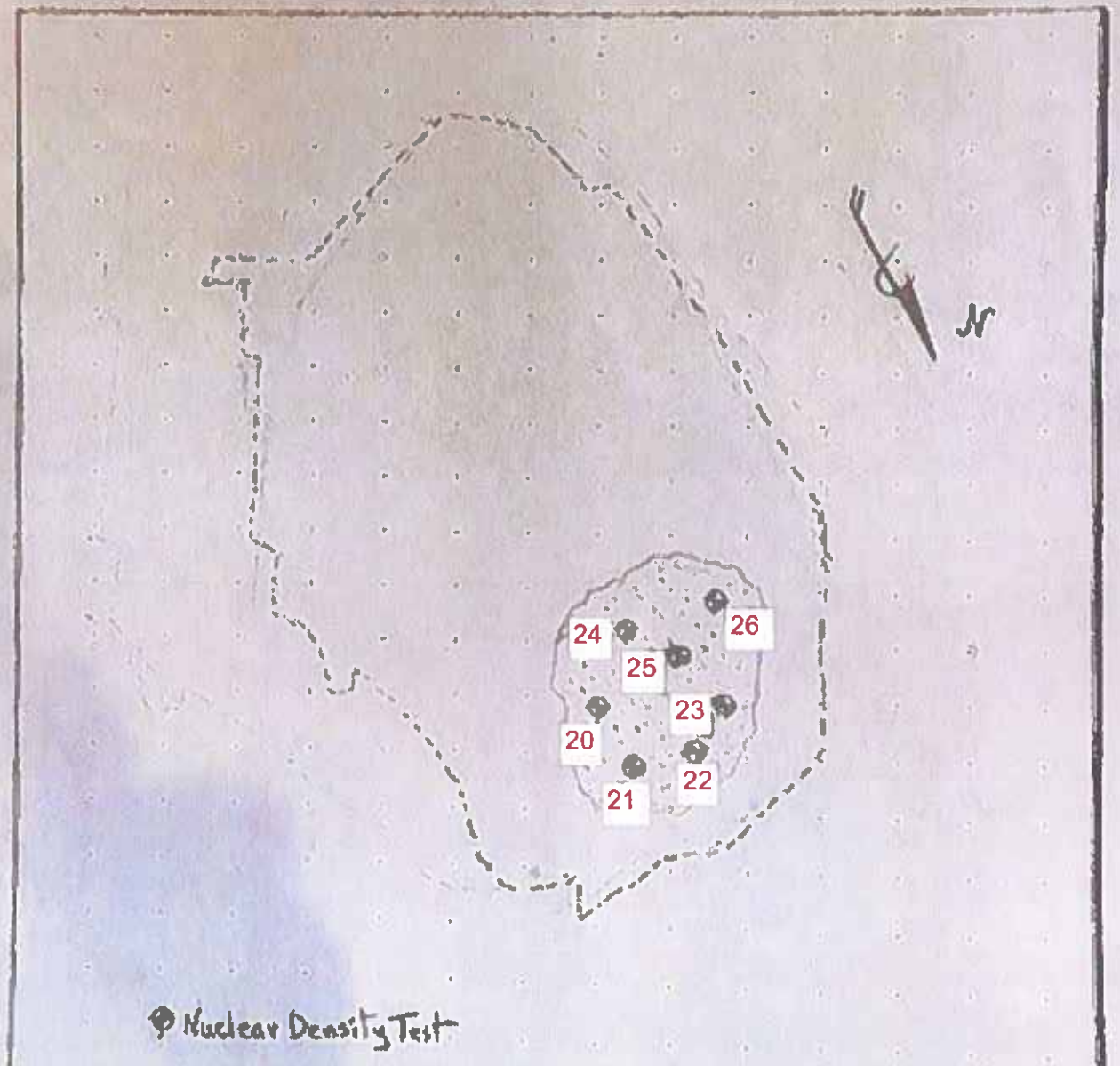
10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering & Testing, Inc.

Project Field Sketch

Project: Ledge Rd SIF Andover
Location: Andover, MA

Date: 10-18-22
Job No#: 26023



SKETCH MAY NOT BE TO SCALE

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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
16	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel glass trace silt (L33621)	120.2	7.4	118.3	8.0	98.4	92+	Pass
17	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel glass trace silt (L33621)	120.2	7.4	119.7	9.6	99.6	92+	Pass
18	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel glass trace silt (L33621)	120.2	7.4	116.2	10.8	96.7	92+	Pass
19	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	123.3	9.1	93.1	92+	Pass
20	10/18/23	See sketch	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	122.9	10.5	92.8	92+	Pass
21	10/18/23	See sketch	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	123.1	10.7	93.0	92+	Pass
22	10/18/23	See sketch	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	127.6	8.3	96.4	92+	Pass
23	10/18/23	See sketch	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	124.9	9.8	94.3	92+	Pass
24	10/18/23	See sketch	2' BFG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	125.2	12.4	94.6	92+	Pass
25	10/18/23	See sketch	2' BFG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	126.3	11.6	95.4	92+	Pass
26	10/18/23	See sketch	2' BFG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	124.5	9.6	94.0	92+	Pass

Soil Field Testing Notes and/or Observations	FG = Finish Grade
	BFG = Below Finish Grade

Field Testing Performed using a Nuclear Moisture Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	October 23, 2023
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Sunny, 40°-60° °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
(1) Large Excavator
(1) Large Front-End Loader
(1) Large Riding Vibratory Roller

Arriving onsite this morning as scheduled, the undersigned observer met with Mr. Mike Bates, the project superintendent, and Mr. Myles Johnson, from CDM Smith, who stated that compaction tests, five (5) tests per acre, were required for a section of the site (see sketch).

A review of the work area found that the crew had; prior to my arrival, prepared the area to be tested.

During this visit, a total of twenty-two (22) nuclear moisture/density readings (tests #27 through #48) were performed. All of the results met the stated 92% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Mr. Johnson was notified of today's field observation and testing prior to my departure.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Rez Sbat

10 Mason Street, Worcester, MA 01609
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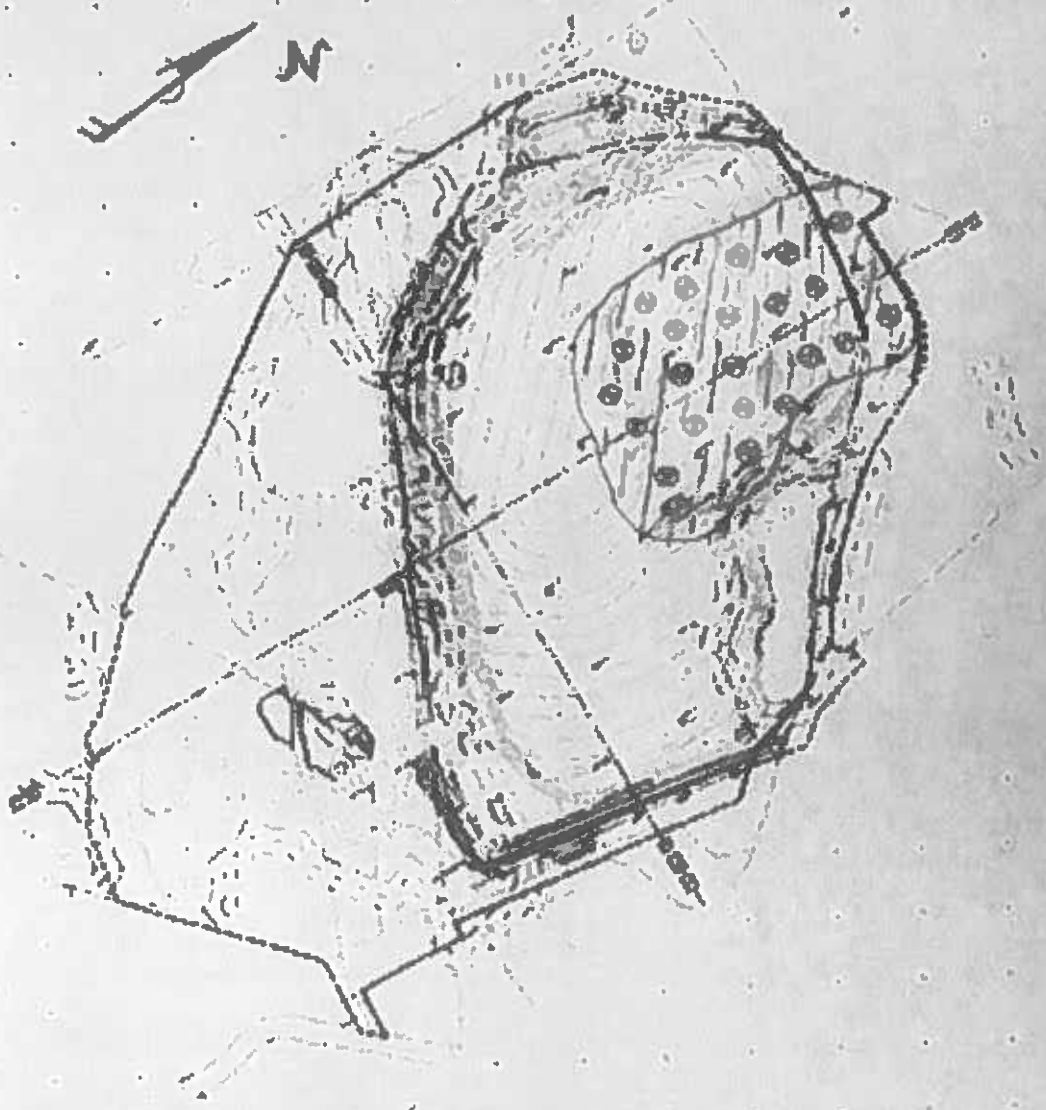
Yankee Engineering & Testing, Inc.

Project Field Sketch

Project: Large Rd SF Andover
Location: Andover, MA

Date: 1-23-23
Job No#: 26023



SKETCH MAY NOT BE TO SCALE

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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
16	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel/glass trace silt (L33621)	120.2	7.4	118.3	8.0	98.4	92+	Pass
17	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel/glass trace silt (L33621)	120.2	7.4	119.7	9.6	99.6	92+	Pass
18	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 2" sand little gravel/glass trace silt (L33621)	120.2	7.4	116.2	10.8	96.7	92+	Pass
19	10/16/23	50' x 50' Area South of in-place Asphalt	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	123.3	9.1	93.1	92+	Pass
20	10/18/23	See sketch	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	122.9	10.5	92.8	92+	Pass
21	10/18/23	See sketch	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	123.1	10.7	93.0	92+	Pass
22	10/18/23	See sketch	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	127.6	8.3	96.4	92+	Pass
23	10/18/23	See sketch	FG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	124.9	9.8	94.3	92+	Pass
24	10/18/23	See sketch	2' BFG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	125.2	12.4	94.6	92+	Pass
25	10/18/23	See sketch	2' BFG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	126.3	11.6	95.4	92+	Pass
26	10/18/23	See sketch	2' BFG	Dark brown 3" max sand and gravel trace silt (L33619)	132.4	6.0	124.5	9.6	94.0	92+	Pass
27	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	125.0	10.2	94.3	92+	Pass
28	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	128.5	7.4	97.0	92+	Pass
29	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	122.3	11.7	92.3	92+	Pass
30	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	126.1	8.5	95.2	92+	Pass

Soil Field Testing Notes and/or Observations	FG = Finish Grade
	BFG = Below Finish Grade

Field Testing Performed using a Nuclear Moisture Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
31	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	128.4	9.2	96.9	92+	Pass
32	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	124.5	10.1	94.0	92+	Pass
33	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	124.7	10.8	94.1	92+	Pass
34	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	123.9	9.5	93.5	92+	Pass
35	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	124.9	9.3	94.3	92+	Pass
36	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	124.7	9.6	94.1	92+	Pass
37	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L 33618)	132.5	6.7	126.7	9.8	95.6	92+	Pass
38	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	124.0	10.5	93.6	92+	Pass
39	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L 33618)	132.5	6.7	126.0	10.2	95.1	92+	Pass
40	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	123.6	9.8	93.3	92+	Pass
41	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L 33618)	132.5	6.7	127.5	11.1	96.2	92+	Pass
42	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	123.9	9.6	93.5	92+	Pass
43	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L 33618)	132.5	6.7	125.6	11.5	94.8	92+	Pass
44	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	122.7	8.9	92.6	92+	Pass
45	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L 33618)	132.5	6.7	124.1	10.5	93.7	92+	Pass

Soil Field Testing Notes and/or Observations	

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D 6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Compaction (%)	Min. Spec (%)	Pass or Fail
46	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	127.6	9.9	96.3	92+	Pass
47	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	123.5	9.6	93.2	92+	Pass
48	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	124.8	10.1	94.2	92+	Pass

Soil Field Testing Notes and/or Observations

Field Testing Performed using a Nuclear Moisture Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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10-24

REV NO	DATE	DRWN	CHKD	REMARKS
-				
-				
1	1/2023	JRW	MEJ	UPDATED FOR BIDDING
2	11/2022	PAB	MEJ	REVISED POST-CLOSURE USE/ DRY MATERIALS MANAGEMENT AREA
-	4/2022	JRW	MEJ	REVISED PER RESPONSE TO CONSERVATION COMMISSION PEER REVIEW COMMENTS

DESIGNED BY D. HOWARD
DRAWN BY J. HOLT
SHEET CHKD BY C. CAIRD
CHKD (2nd CK'D BY) R. JONES
APPROVED BY R. JONES
DATE MARCH 2023

CDM Smith
75 State Street, Suite 701
Boston, MA 02109
Tel (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

OVERALL SITE KEY PLAN

PROJECT NO 8235-113811
FILE NAME G003KEYPL.DWG
SHEET NO G-3

Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	October 24, 2023
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Cloudy, 60° °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:

(2) Bulldozers (3) Dump Trucks

(2) Excavators (2) Vibratory Rollers

Arriving onsite this afternoon as scheduled, the undersigned writer met with Mr. Myles Johnson, from CDM Smith, who indicated the locations to be tested.

A review of the work area found that the following area had been prepared for testing. Below are the coordinates of the perimeter of the area.

N: 3070240.67	N: 3070350.412	N: 3070285.684	N: 3070001.072
E: 739479.550	E: 739372.958	E: 739291.022	E: 739352.560
Elev.: 193.2	Elev.: 194.218	Elev.: 193.550	Elev.: 192.116

During this visit, a total of nineteen (19) nuclear moisture/density readings (tests #49 through #67) were performed. The field compaction percentages from tests found that the majority of the tests failed to meet the stated 92% minimum, indicating Unsatisfactory compaction at the tested elevations/locations for most tests. Please refer to the compaction summary sheets for results, based on the applied soil proctor value on file.

Mr. Johnson was informed of today's field observation and testing prior to my departure.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet.

Report By: Rob Whitt

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10-24

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

OVERALL SITE KEY PLAN

G-3

SHEET 1 OF 4

SHEET 2 OF 4

SHEET 3 OF 4

SHEET 4 OF 4

SHEET MATCH LINE

PROJECT LIMITS

PROPERTY LINE

100 FT BUFFER

75 FT NO BUILD

50 FT NO DISTURB

GREENWOOD ROAD

CHANDLER ROAD

LEDGE ROAD

VERNAL POOL #1

VERNAL POOL #2

VERNAL POOL #3

VERNAL POOL #4

GRAVEL ACCESS DRIVE

3/15/2013

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	**JBS//Andover Ledge Road SLF**	**Project No#**	**26023**
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Compaction (%)	Min. Spec (%)	Pass or Fail
46	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	127.6	9.9	96.3	92+	Pass
47	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	123.5	9.6	93.2	92+	Pass
48	10/23/23	See sketch	varies	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	124.8	10.1	94.2	92+	Pass
49	10/24/23	See field report for area	1st Lift	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	121.2	11.2	91.5	92+	FAIL
50	10/24/23	See field report for area	1st Lift	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	101.9	19.4	76.9	92+	FAIL
51	10/24/23	See field report for area	1st Lift	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	122.9	10.2	92.8	92+	Pass
52	10/24/23	See field report for area	1st Lift	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	121.3	9.7	91.5	92+	FAIL
53	10/24/23	See field report for area	1st Lift	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	126.7	8.2	95.6	92+	Pass
54	10/24/23	See field report for area	1st Lift	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	120.5	8.4	90.9	92+	FAIL
55	10/24/23	See field report for area	1st Lift	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	115.3	11.1	87.0	92+	FAIL
56	10/24/23	See field report for area	1st Lift	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	123.0	9.7	92.8	92+	Pass
57	10/24/23	See field report for area	1st Lift	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	139.4	7.9	105.2	92+	Pass
58	10/24/23	See field report for area	1st Lift	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	111.7	16.5	84.3	92+	FAIL
59	10/24/23	See field report for area	1st Lift	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	124.8	10.4	94.2	92+	Pass
60	10/24/23	See field report for area	1st Lift	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	122.1	9.9	92.2	92+	Pass
Soil Field Testing Notes and/or Observations											

Field Testing Performed using a Nuclear Moisture Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
61	10/24/23	See field report for area	1st Lift	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	116.7	9.1	88.1	92+	FAIL
62	10/24/23	See field report for area	1st Lift	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	130.5	5.9	98.5	92+	Pass
63	10/24/23	See field report for area	1st Lift	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	116.8	11.7	88.2	92+	FAIL
64	10/24/23	See field report for area	1st Lift	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	116.6	10.9	88.0	92+	FAIL
65	10/24/23	See field report for area	1st Lift	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	115.4	11.0	87.1	92+	FAIL
66	10/24/23	See field report for area	1st Lift	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	113.4	10.4	85.6	92+	FAIL
67	10/24/23	See field report for area	1st Lift	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	110.4	8.3	83.3	92+	FAIL
68	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	112.2	13.0	84.7	92+	FAIL
69	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	111.6	8.2	84.2	92+	FAIL
70	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	117.3	10.7	88.5	92+	FAIL
71	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	116.1	10.7	87.6	92+	FAIL
72	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	124.7	9.1	94.1	92+	Pass
73	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	103.1	14.3	77.8	92+	FAIL
74	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	117.2	11.3	88.5	92+	FAIL
75	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	124.3	9.2	93.8	92+	Pass

Soil Field Testing Notes and/or Observations	

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	October 25, 2023
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Cloudy, 70° °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
(1) Bulldozer (3) Dump Trucks
(1) Front-End Loader

Arriving onsite this afternoon as scheduled, the undersigned writer met with Mr. Johnson, the acting foreman.

A review of the work areas found that areas where elevation(s) have visible surface moisture were directly adjacent to the lower elevation(s).

Throughout this visit, the crew used the dump trucks, feeding backfill material to the bulldozer, to be spread in 1' compacted lifts.

During this visit, a total of seventeen (17) nuclear moisture/density readings (tests #68 through #84) were performed. The field compaction percentages from tests found that the majority of the tests failed to meet the stated 92% minimum, indicating UNsatisfactory compaction at the tested elevations/locations for most tests. Please refer to the compaction summary sheets for results, based on the applied soil proctor value on file.

It should be noted that compaction testing was suspended due to the high moisture readings and visible surface moisture throughout the site.

Mr. Johnson was informed of today's field observation and testing prior to my departure.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Rob Whitt

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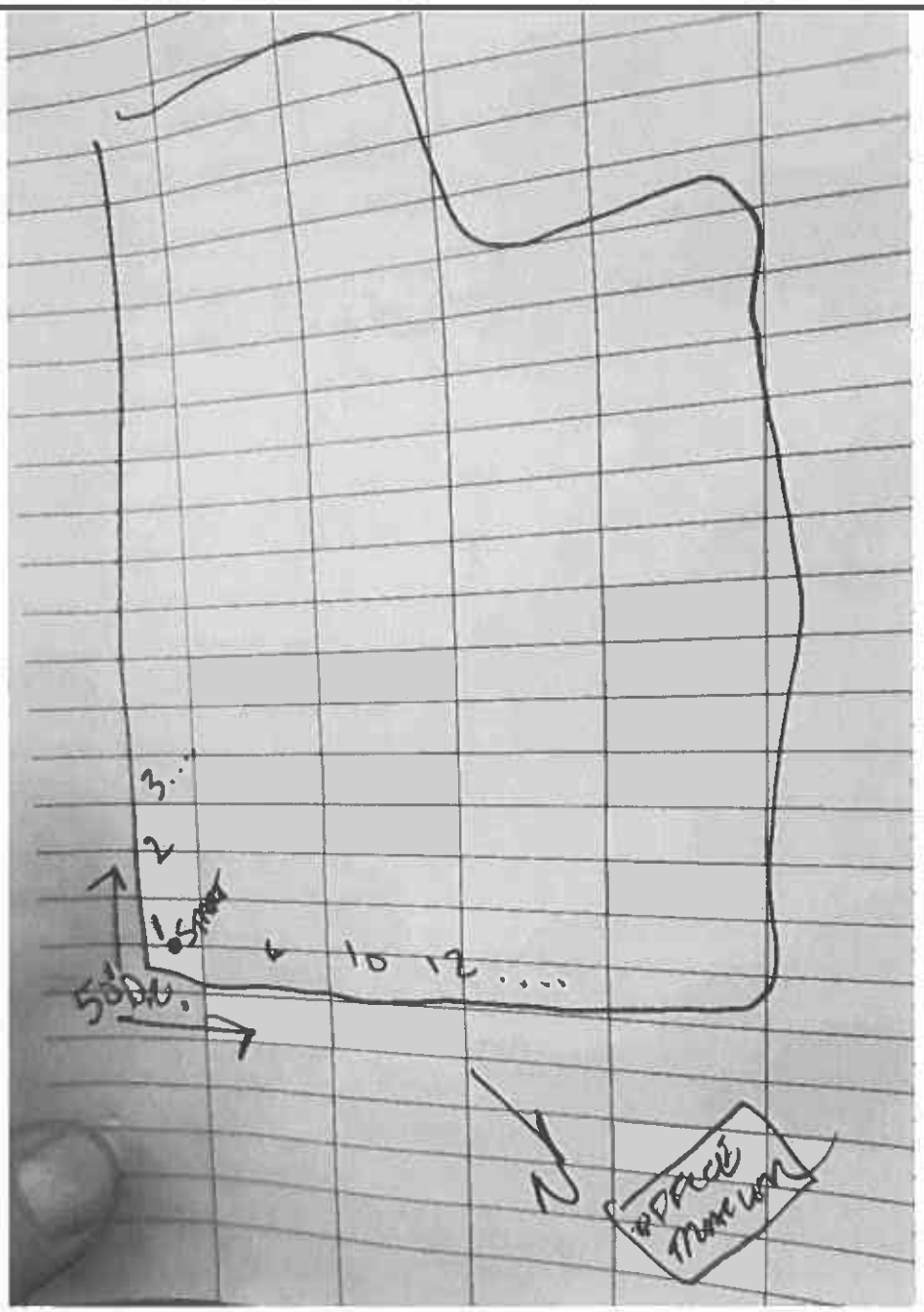
Yankee Engineering and Testing, Inc.

Project Site Field Sketch

Project Name:	JBS//Andover Ledge Road SLF	**Date:**	October 25, 2023
Project Address:	Ledge Road, Andover MA	**Project No.**	26023



TESTING NOTES & OBSERVATIONS:

Sketch may not be to scale

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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	**JBS//Andover Ledge Road SLF**	**Project No#**	**26023**
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
61	10/24/23	See field report for area	1st Lift	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	116.7	9.1	88.1	92+	FAIL
62	10/24/23	See field report for area	1st Lift	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	130.5	5.9	98.5	92+	Pass
63	10/24/23	See field report for area	1st Lift	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	116.8	11.7	88.2	92+	FAIL
64	10/24/23	See field report for area	1st Lift	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	116.6	10.9	88.0	92+	FAIL
65	10/24/23	See field report for area	1st Lift	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	115.4	11.0	87.1	92+	FAIL
66	10/24/23	See field report for area	1st Lift	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	113.4	10.4	85.6	92+	FAIL
67	10/24/23	See field report for area	1st Lift	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	110.4	8.3	83.3	92+	FAIL
68	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	112.2	13.0	84.7	92+	FAIL
69	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	111.6	8.2	84.2	92+	FAIL
70	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	117.3	10.7	88.5	92+	FAIL
71	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	116.1	10.7	87.6	92+	FAIL
72	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	124.7	9.1	94.1	92+	Pass
73	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	103.1	14.3	77.8	92+	FAIL
74	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	117.2	11.3	88.5	92+	FAIL
75	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	124.3	9.2	93.8	92+	Pass
Soil Field Testing Notes and/or Observations											

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	**JBS//Andover Ledge Road SLF**	**Project No#**	**26023**
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
76	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	117.4	9.7	88.6	92+	FAIL
77	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	118.0	9.1	89.1	92+	FAIL
78	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	111.7	13.1	84.3	92+	FAIL
79	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	121.5	9.1	91.7	92+	FAIL
80	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	116.3	13.1	87.8	92+	FAIL
81	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	126.3	10.7	95.3	92+	Pass
82	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	123.6	7.0	93.3	92+	Pass
83	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	118.8	9.8	89.7	92+	FAIL
84	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	124.4	7.1	93.9	92+	Pass

Soil Field Testing Notes and/or Observations	

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	November 1, 2023
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Cloudy, 40°'s °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:

(3) Dump Trucks
(1) Excavator
(1) Vibratory Roller
(1) Bulldozer

Arriving onsite this morning as scheduled, the undersigned writer met with Mr. Myles Johnson, representing CDM Smith.

A review of the work areas noted that the crew was continuing to place and compact material in the area adjacent to the area to be tested.

During this visit, a total of three (3) nuclear moisture/density readings (tests #85 through #87) were performed. All of the results met the stated 95% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

It should be noted that there was visible moisture and standing water in the testing locations. Three (3) additional unrecorded tests failed to meet the stated 92% minimum compaction percentage; these areas will be retested at a later date.

Mr. Myles was informed of today's field observation and testing prior to my departure.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Rob Witt

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

11-01

REV NO	DATE	DRAWN	CHK'D	REMARKS
3	3/2021	JBH	MCJ	UPDATED FOR BIDDING
2	11/2020	EAD	MCJ	REVISED POST-CLOSURE USE / CPA MATERIALS HANDLING AREA
1	4/2020	JBH	MCJ	REVISED TO RESPOND TO CONSERVATION COMMISSION MITIGATION COMMENTS

DESIGNED BY B. HOWARD
DRAWN BY J. MCS
SHEET CHK'D BY C. CARES
CROSS CHK'D BY M. JONES
APPROVED BY M. JONES
DATE MARCH 2021

CDM Smith

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

OVERALL SITE KEY PLAN

PROJECT NO 6133-113811
FILE NAME GDC3KYPLN.DWG
SHEET NO C-3

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	**JBS//Andover Ledge Road SLF**	**Project No#**	**26023**
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
76	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	117.4	9.7	88.6	92+	FAIL
77	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	118.0	9.1	89.1	92+	FAIL
78	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	111.7	13.1	84.3	92+	FAIL
79	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	121.5	9.1	91.7	92+	FAIL
80	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	116.3	13.1	87.8	92+	FAIL
81	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	126.3	10.7	95.3	92+	Pass
82	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	123.6	7.0	93.3	92+	Pass
83	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	118.8	9.8	89.7	92+	FAIL
84	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	124.4	7.1	93.9	92+	Pass
85	11/1/23	See Sketch	191'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	122.2	9.2	92.3	92+	Pass
86	11/1/23	See Sketch	191'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	130.8	8.2	98.8	92+	Pass
87	11/1/23	See Sketch	191'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	122.0	9.2	92.1	92+	Pass
88	11/7/23	See Sketch	192'-196'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	125.5	8.1	94.8	92+	Pass
89	11/7/23	See Sketch	192'-196'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	126.0	8.3	95.2	92+	Pass
90	11/7/23	See Sketch	192'-196'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	127.7	9.9	96.5	92+	Pass
Soil Field Testing Notes and/or Observations											

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	November 7, 2023
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Cloudy, low 60°'s °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:

(3) Dump Trucks
(1) Excavator
(1) Vibratory Roller
(1) Bulldozer

Arriving onsite this morning as scheduled, the undersigned observer met with Mr. Myles Johnson, representing CDM Smith.

A review of the work areas found the crew continuing to place and compact material in the area adjacent to the area to be tested.

During this visit, a total of six (6) nuclear moisture/density readings (tests #88 through #93) were performed. All of the results met the stated 95% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

It should be noted that there was visible moisture and standing water in the testing locations. Nine (9) additional unrecorded tests failed to meet the stated 92% minimum compaction percentage; these areas will be retested at a later date.

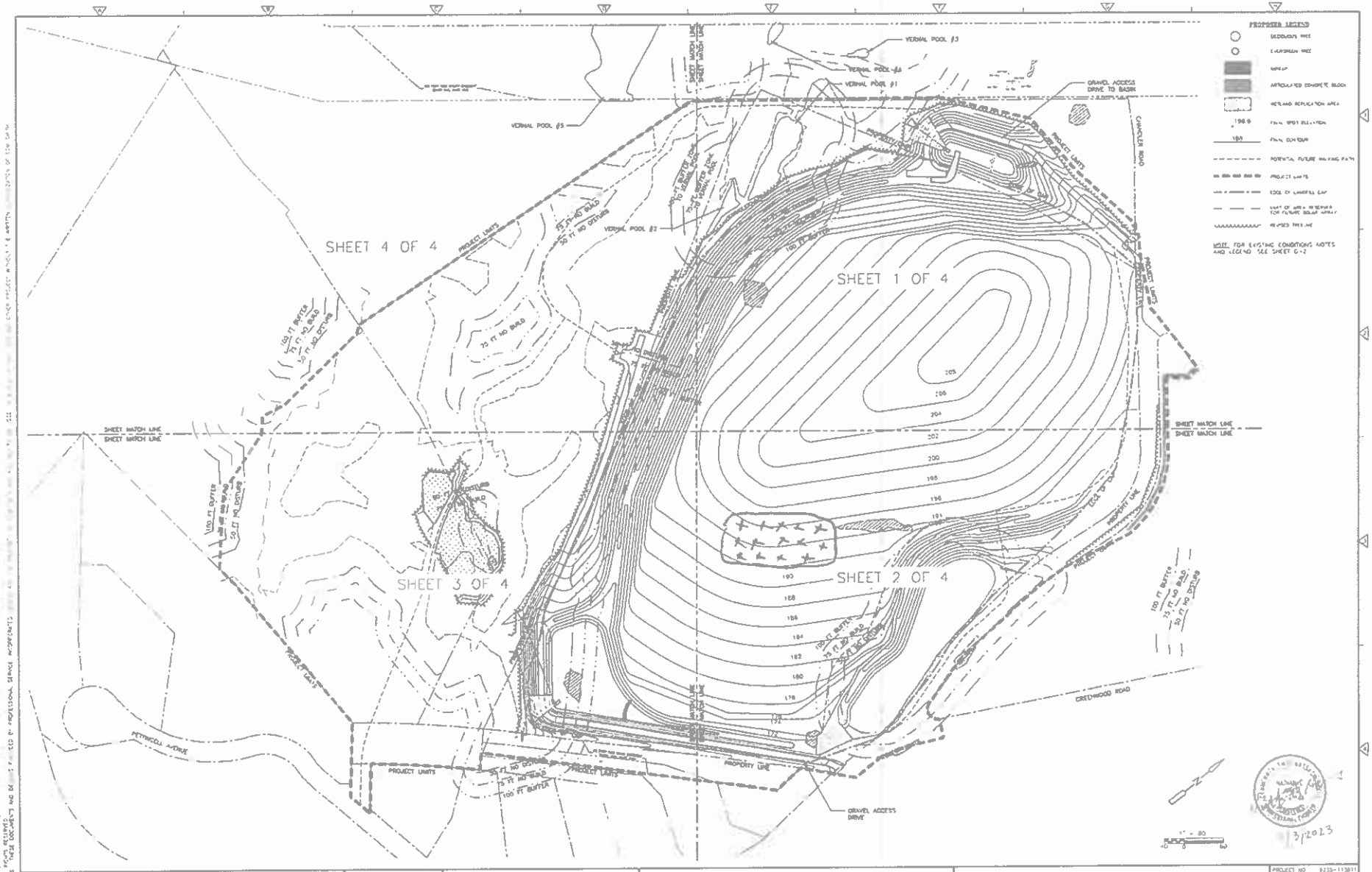
Mr. Myles was made aware of today's field observation and testing prior to my departure.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Rob Whitt

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

11-07



REV NO	DATE	DRAWN	CHKD	REMARKS
3	3/2023	JMH	MEA	UPDATED FOR COMMENTS
2	11/2022	KAB	MEA	REMOVED POST-CLOSURE USE / EPD MATERIALS HANDLING AREA
1	4/2022	JMH	MEA	REVISED TO RESPOND TO CONSERVATION COMMISSION PEER REVIEW COMMENTS

DESIGNED BY B. HOWARD
DRAWN BY K. MEA
SHEET CHK'D BY C. JONES
CROSS CHK'D BY G. JONES
APPROVED BY T. JONES
DATE MARCH 2023

CDM Smith
75 State Street Suite 701
Boston MA 02109
T 617 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

OVERALL SITE KEY PLAN

PROJECT NO 6233-113811
FILE NAME CDSCIVYPL.DWG
SHEET NO G-3

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	**JBS//Andover Ledge Road SLF**	**Project No#**	**26023**
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
76	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	117.4	9.7	88.6	92+	FAIL
77	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	118.0	9.1	89.1	92+	FAIL
78	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	111.7	13.1	84.3	92+	FAIL
79	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	121.5	9.1	91.7	92+	FAIL
80	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	116.3	13.1	87.8	92+	FAIL
81	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	126.3	10.7	95.3	92+	Pass
82	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	123.6	7.0	93.3	92+	Pass
83	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	118.8	9.8	89.7	92+	FAIL
84	10/25/23	See Sketch		Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	124.4	7.1	93.9	92+	Pass
85	11/1/23	See Sketch	191'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	122.2	9.2	92.3	92+	Pass
86	11/1/23	See Sketch	191'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	130.8	8.2	98.8	92+	Pass
87	11/1/23	See Sketch	191'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	122.0	9.2	92.1	92+	Pass
88	11/7/23	See Sketch	192'-196'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	125.5	8.1	94.8	92+	Pass
89	11/7/23	See Sketch	192'-196'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	126.0	8.3	95.2	92+	Pass
90	11/7/23	See Sketch	192'-196'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	127.7	9.9	96.5	92+	Pass
Soil Field Testing Notes and/or Observations											

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D 6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	**JBS//Andover Ledge Road SLF**	**Project No#**	**26023**
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
91	11/7/23	See Sketch	192'-196'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	127.3	9.6	96.1	92+	Pass
92	11/7/23	See Sketch	192'-196'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	127.1	9.2	96.0	92+	Pass
93	11/7/23	See Sketch	192'-196'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	125.7	9.8	94.9	92+	Pass
94	11/9/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	125.2	9.1	94.6	92+	Pass
95	11/9/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	126.3	9.4	95.4	92+	Pass
96	11/9/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	126.1	8.3	95.2	92+	Pass
97	11/9/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	125.6	8.7	94.9	92+	Pass
98	11/9/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	128.8	8.3	97.3	92+	Pass
99	11/9/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	125.8	10.9	95.0	92+	Pass
100	11/9/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	133.1	7.8	100.5	92+	Pass
101	11/9/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	137.1	6.8	103.5	92+	Pass
102	11/9/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	123.1	8.6	93.0	92+	Pass
103	11/9/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	132.8	7.9	100.3	92+	Pass
104	11/16/23	Area "A" see sketch	194'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	124.4	9.3	93.9	92+	Pass
105	11/16/23	Area "A" see sketch	194'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	122.8	8.6	92.7	92+	Pass
Soil Field Testing Notes and/or Observations											

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	November 9, 2023
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Cloudy, 30°'s °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:

(3) Dump Trucks	(1) Vibratory Roller
(1) Excavator	(1) Bulldozer

Arriving onsite this morning as scheduled, the undersigned writer met with Mr. Myles Johnson, representing CDM Smith.

A review of the work areas noted that the crew was continuing to place and compact material in the area adjacent to the area to be tested.

During this visit, a total of ten (10) nuclear moisture/density readings (tests #94 through #103) were performed. All of the results met the stated 95% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

It should be noted that there was visible moisture and standing water in the testing locations. Fourteen (14) additional unrecorded tests failed to meet the stated 92% minimum compaction percentage; these areas will be retested at a later date.

Mr. Myles was notified of today's field observation and testing prior to my departure.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Rob Whitt

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

11-09

REV NO	DATE	DRWN	CHKD	REMARKS
3	3/2023	JBM	MJ	UPDATED FOR BIDDING
2	11/2019	KAB	MJ	REVISED POST-CLOSURE USE/ CPM MATERIALS HANDLING AREA
1	4/2019	JBM	MJ	RE: TO RESPOND TO CONSERVATION COMMISSION PEER REVIEW #1 COMMENTS

DESIGNED BY: D. HOWARD
DRAWN BY: J. LEE
SHEET CHK'D BY: C. CAMEL
CROSS CHK'D BY: B. JENNETT
APPROVED BY: B. JENNETT
DATE: MARCH 2023

CDM Smith
75 State Street, Suite 701
Boston, MA 02109
tel (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

OVERALL SITE KEY PLAN

PROJECT NO: 62735
FILE NAME: COVSHT.DWG
SHEET NO: G-3

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	**JBS//Andover Ledge Road SLF**	**Project No#**	**26023**
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
91	11/7/23	See Sketch	192'-196'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	127.3	9.6	96.1	92+	Pass
92	11/7/23	See Sketch	192'-196'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	127.1	9.2	96.0	92+	Pass
93	11/7/23	See Sketch	192'-196'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	125.7	9.8	94.9	92+	Pass
94	11/9/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	125.2	9.1	94.6	92+	Pass
95	11/9/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	126.3	9.4	95.4	92+	Pass
96	11/9/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	126.1	8.3	95.2	92+	Pass
97	11/9/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	125.6	8.7	94.9	92+	Pass
98	11/9/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	128.8	8.3	97.3	92+	Pass
99	11/9/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	125.8	10.9	95.0	92+	Pass
100	11/9/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	133.1	7.8	100.5	92+	Pass
101	11/9/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	137.1	6.8	103.5	92+	Pass
102	11/9/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	123.1	8.6	93.0	92+	Pass
103	11/9/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	132.8	7.9	100.3	92+	Pass
104	11/16/23	Area "A" see sketch	194'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	124.4	9.3	93.9	92+	Pass
105	11/16/23	Area "A" see sketch	194'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	122.8	8.6	92.7	92+	Pass
Soil Field Testing Notes and/or Observations											

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	November 14, 2023
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Cloudy, 45º ˚F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:

(2) Excavators
(3) Articulated Dump Trucks
(1) Articulated Vibratory Roller
(1) Bulldozer

Arriving onsite this morning as scheduled, the undersigned technician met with Michael, the contractor's representative.

A review of the work areas noted that an area adjacent to the previously tested area starting 150'± from edge by site trailer had been prepared for testing.

During this visit, a total of seventeen (17) nuclear moisture/density readings (tests #197 through #213) were performed. All of the results met the stated 92% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

It should be noted that five (5) additional unrecorded tests returned values less than the stated 92% minimum compaction requirement; the low test areas were recompacted until passing values were achieved.

Michael was made aware of today's field compaction test results prior to my departure.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Rob Witt

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	**JBS//Andover Ledge Road SLF**	**Project No#**	**26023**
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
196	12/7/23	Northeast Cell See Sketch	FG	Black 2" max silty sand/organics some gravel (landill mixture) (L-33824)	92.3	21.0	90.8	19.2	98.4	90+	Pass
197	11/14/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	125.2	9.1	94.6	92+	Pass
198	11/14/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	126.3	9.4	95.4	92+	Pass
199	11/14/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	126.1	8.3	95.2	92+	Pass
200	11/14/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	125.6	8.7	94.9	92+	Pass
201	11/14/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	128.8	8.3	97.3	92+	Pass
202	11/14/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	125.8	10.9	95.0	92+	Pass
203	11/14/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	133.1	7.8	100.5	92+	Pass
204	11/14/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	137.1	6.8	103.5	92+	Pass
205	11/14/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	123.1	8.6	93.0	92+	Pass
206	11/14/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	125.7	9.3	94.9	92+	Pass
207	11/14/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	131.7	8.2	99.5	92+	Pass
208	11/14/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	125.9	8.9	95.1	92+	Pass
209	11/14/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	123.9	9.4	93.6	92+	Pass
210	11/14/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	126.0	9.3	95.2	92+	Pass
Soil Field Testing Notes and/or Observations		FG = Finish Grade									

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	**JBS//Andover Ledge Road SLF**	**Project No#**	**26023**
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
211	11/14/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	125.7	9.3	94.9	92+	Pass
212	11/14/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	123.6	9.9	93.4	92+	Pass
213	11/14/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	132.8	7.9	100.3	92+	Pass
214	12/13/23	See Sketch	200'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	128.8	7.0	107.2	92+	Pass
215	12/13/23	See Sketch	200'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	126.3	7.2	105.1	92+	Pass
216	12/13/23	See Sketch	200'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	120.3	6.2	100.1	92+	Pass
217	12/13/23	See Sketch	200'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	116.6	5.5	97.0	92+	Pass
218	12/13/23	See Sketch	200'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	116.1	7.8	96.6	92+	Pass
219	12/13/23	See Sketch	200'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	120.2	7.4	112.6	9.2	93.7	92+	Pass
220	12/13/23	See Sketch	200'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	112.4	7.1	93.5	92+	Pass
221	12/13/23	See Sketch	200'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	120.6	5.9	100.3	92+	Pass
222	12/15/23	See Sketch	196'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	95.2	20.2	103.1	92+	Pass
223	12/15/23	See Sketch	196'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	111.4	16.7	92.7	92+	Pass
224	12/15/23	See Sketch	196'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	94.9	16.1	102.8	92+	Pass
225	12/15/23	See Sketch	196'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	110.9	17.6	92.3	92+	Pass
Soil Field Testing Notes and/or Observations											

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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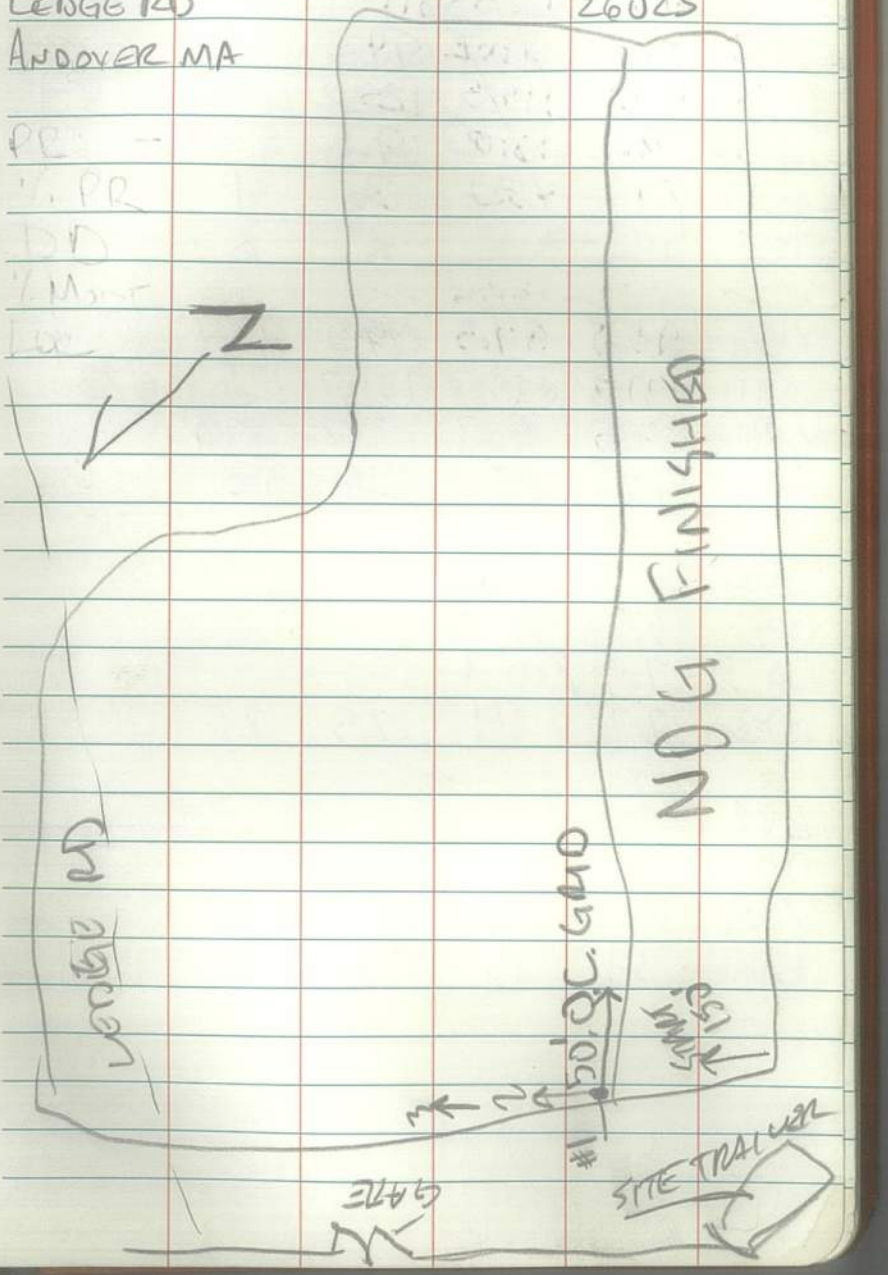
20231114 ✓
LEDGE RD
ANDOVER MA

11:45°F
CLOUDY

26023



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Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	November 16, 2023
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Sunny, 40°-60° °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
(1) Large Bulldozer (1) Large Riding Roller

Arriving onsite this morning as scheduled, the undersigned observer met with Mr. Mike Bates, the project superintendent, who requested compaction testing on a new lift in two (2) sections, with one (1) test every 50'.

A review of the work areas found that; prior to my arrival, the crew had placed and compacted, with a large riding roller, a lift of dark brown 2" max silty sand/gravel material on a portion of area "A", and of dark brown 2" max sand/gravel in a portion of area "B".

During this visit, a total of fifteen (15) nuclear moisture/density readings (tests #104 through #118) were performed. All of the results met the stated 92% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Mr. Bates was notified of today's field compaction test results prior to my departure.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Rez Sbat

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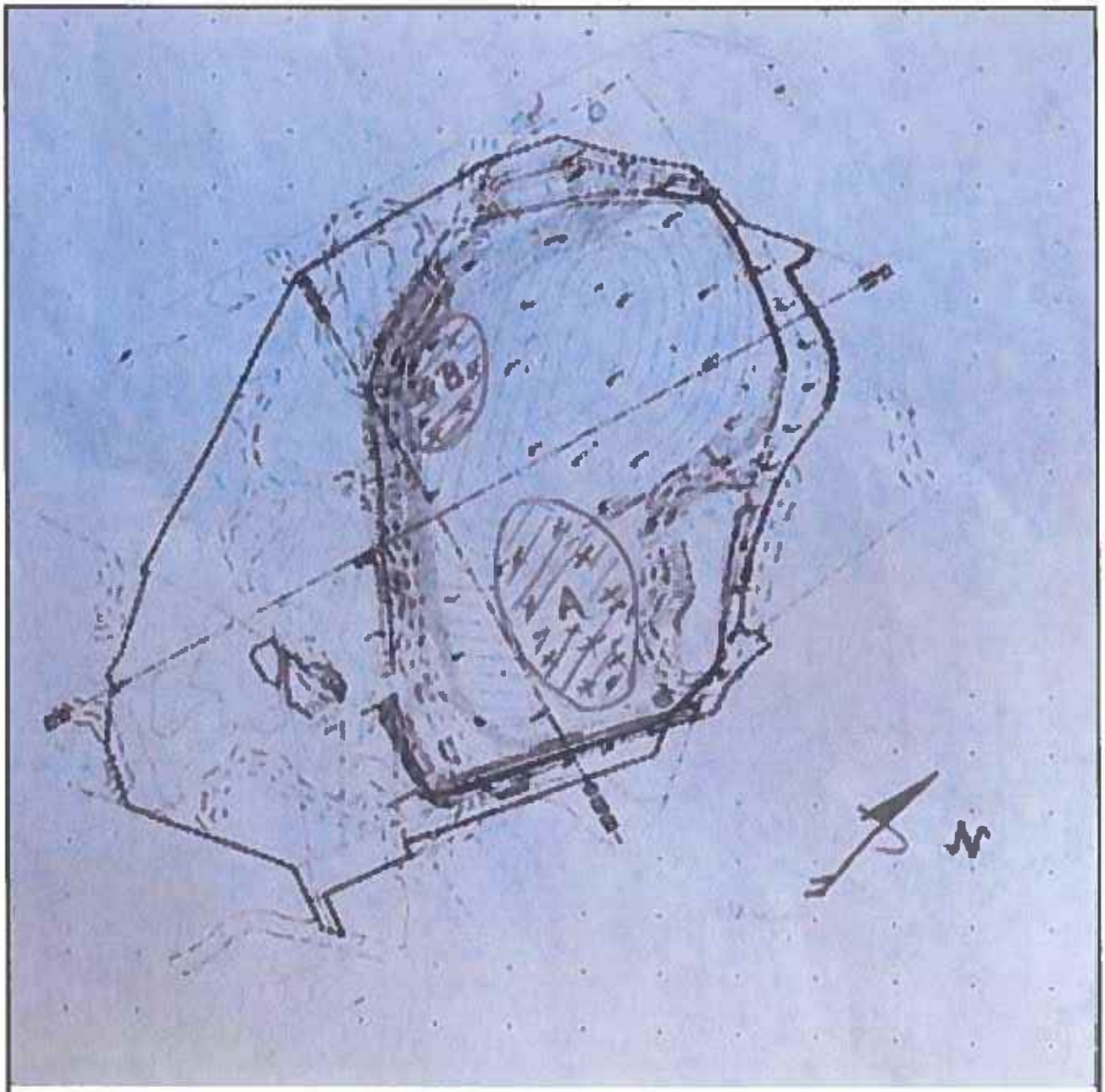
Yankee Engineering and Testing, Inc.

Project Site Field Sketch

Project Name:	JBS//Andover Ledge Road SLF	**Date:**	November 16, 2023
Project Address:	Ledge Road, Andover MA	**Project No.**	26023



TESTING NOTES & OBSERVATIONS:

Sketch may not be to scale

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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
91	11/7/23	See Sketch	192'-196'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	127.3	9.6	96.1	92+	Pass
92	11/7/23	See Sketch	192'-196'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	127.1	9.2	96.0	92+	Pass
93	11/7/23	See Sketch	192'-196'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	125.7	9.8	94.9	92+	Pass
94	11/9/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	125.2	9.1	94.6	92+	Pass
95	11/9/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	126.3	9.4	95.4	92+	Pass
96	11/9/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	126.1	8.3	95.2	92+	Pass
97	11/9/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	125.6	8.7	94.9	92+	Pass
98	11/9/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	128.8	8.3	97.3	92+	Pass
99	11/9/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	125.8	10.9	95.0	92+	Pass
100	11/9/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	133.1	7.8	100.5	92+	Pass
101	11/9/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	137.1	6.8	103.5	92+	Pass
102	11/9/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	123.1	8.6	93.0	92+	Pass
103	11/9/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	132.8	7.9	100.3	92+	Pass
104	11/16/23	Area "A" see sketch	194'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	124.4	9.3	93.9	92+	Pass
105	11/16/23	Area "A" see sketch	194'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	122.8	8.6	92.7	92+	Pass
Soil Field Testing Notes and/or Observations											

Field Testing Performed using a Nuclear Moisture Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	**JBS//Andover Ledge Road SLF**	**Project No#**	**26023**
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
106	11/16/23	Area "A" see sketch	194'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	129.5	6.4	97.7	92+	Pass
107	11/16/23	Area "A" see sketch	194'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	129.8	8.6	98.0	92+	Pass
108	11/16/23	Area "A" see sketch	194'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	128.2	8.5	96.8	92+	Pass
109	11/16/23	Area "A" see sketch	194'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	129.6	9.4	97.8	92+	Pass
110	11/16/23	Area "A" see sketch	194'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	127.6	8.0	96.3	92+	Pass
111	11/16/23	Area "A" see sketch	194'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	128.3	9.1	96.8	92+	Pass
112	11/16/23	Area "A" see sketch	194'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	125.2	8.6	94.5	92+	Pass
113	11/16/23	Area "A" see sketch	194'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	127.1	8.8	95.9	92+	Pass
114	11/16/23	Area "B" see sketch	198'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	124.3	10.9	103.4	92+	Pass
115	11/16/23	Area "B" see sketch	198'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	122.7	15.3	102.1	92+	Pass
116	11/16/23	Area "B" see sketch	198'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	124.7	11.6	103.7	92+	Pass
117	11/16/23	Area "B" see sketch	198'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	123.6	10.8	102.8	92+	Pass
118	11/16/23	Area "B" see sketch	198'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	123.0	12.4	102.3	92+	Pass
119	11/21/23	See Sketch	197'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	126.2	9.7	95.2	92+	Pass
120	11/21/23	See Sketch	197'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	122.1	10.0	92.2	92+	Pass
Soil Field Testing Notes and/or Observations											

Field Testing Performed using a Nuclear Moisture Density Gauge (per ASTM D 6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	November 21, 2023
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Cloudy, 40° °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:

(3) Dump Trucks
(1) Excavator
(1) Vibratory Roller
(1) Bulldozer

Arriving onsite this morning as scheduled, the undersigned writer met with Mr. Myles Johnson, representing CDM Smith.

A review of the work areas found the crew continuing to place and compact material in the area adjacent to the area to be tested.

During this visit, a total of four (4) nuclear moisture/density readings (tests #119 through #122) were performed. All of the results met the stated 95% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

It should be noted that there was visible moisture and standing water in the testing locations. Five (5) additional unrecorded tests failed to meet the stated 92% minimum compaction percentage; these areas will be retested at a later date.

Mr. Myles was notified of today's field observation and testing prior to my departure.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Rob Whitt

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

11-21

DESIGNED BY		TOWN OF ANDOVER, MASSACHUSETTS LEDGE ROAD LANDFILL CLOSURE PROJECT	OVERALL SITE KEY PLAN
DRAWN BY			
CHECKED BY			
APPROVED BY			
DATE			

CDM Smith

PROJECT NO 6233-113811
FILE NAME 6063KEYPLDWG
SHEET NO G-3

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
106	11/16/23	Area "A" see sketch	194'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	129.5	6.4	97.7	92+	Pass
107	11/16/23	Area "A" see sketch	194'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	129.8	8.6	98.0	92+	Pass
108	11/16/23	Area "A" see sketch	194'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	128.2	8.5	96.8	92+	Pass
109	11/16/23	Area "A" see sketch	194'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	129.6	9.4	97.8	92+	Pass
110	11/16/23	Area "A" see sketch	194'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	127.6	8.0	96.3	92+	Pass
111	11/16/23	Area "A" see sketch	194'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	128.3	9.1	96.8	92+	Pass
112	11/16/23	Area "A" see sketch	194'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	125.2	8.6	94.5	92+	Pass
113	11/16/23	Area "A" see sketch	194'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	127.1	8.8	95.9	92+	Pass
114	11/16/23	Area "B" see sketch	198'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	124.3	10.9	103.4	92+	Pass
115	11/16/23	Area "B" see sketch	198'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	122.7	15.3	102.1	92+	Pass
116	11/16/23	Area "B" see sketch	198'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	124.7	11.6	103.7	92+	Pass
117	11/16/23	Area "B" see sketch	198'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	123.6	10.8	102.8	92+	Pass
118	11/16/23	Area "B" see sketch	198'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	123.0	12.4	102.3	92+	Pass
119	11/21/23	See Sketch	197'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	126.2	9.7	95.2	92+	Pass
120	11/21/23	See Sketch	197'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	122.1	10.0	92.2	92+	Pass
Soil Field Testing Notes and/or Observations											

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	**JBS//Andover Ledge Road SLF**	**Project No#**	**26023**
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Compaction (%)	Min. Spec (%)	Pass or Fail
121	11/21/23	See Sketch	197'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	125.5	8.4	94.7	92+	Pass
122	11/21/23	See Sketch	197'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	122.6	9.4	92.5	92+	Pass
123	11/28/23	See Sketch	194'	Dark brown 2" max sand little gravel glass trace silt (L-33621)	120.2	7.4	108.3	16.8	90.1	92+	FAIL
124	11/28/23	See Sketch	194'	Black 2" max silty sand/organics some gravel (landill mixture) (L-33824)	92.3	21.0	93.7	20.2	101.5	92+	Pass
125	11/28/23	See Sketch	194'	Black 2" max silty sand/organics some gravel (landill mixture) (L-33824)	92.3	21.0	93.7	23.7	101.5	92+	Pass
126	11/29/23	Area 1 see sketch	176'	Black 2" max silty sand/organics some gravel (landill mixture) (L-33824)	92.3	21.0	98.9	20.5	107.2	92+	Pass
127	11/29/23	Area 1 see sketch	176'	Black 2" max silty sand/organics some gravel (landill mixture) (L-33824)	92.3	21.0	104.9	14.3	113.7	92+	Pass
128	11/29/23	Area 1 see sketch	176'	Black 2" max silty sand/organics some gravel (landill mixture) (L-33824)	92.3	21.0	94.3	22.8	102.2	92+	Pass
129	11/29/23	Area 1 see sketch	176'	Black 2" max silty sand/organics some gravel (landill mixture) (L-33824)	92.3	21.0	95.4	24.8	103.4	92+	Pass
130	11/29/23	Area 1 see sketch	176'	Black 2" max silty sand/organics some gravel (landill mixture) (L-33824)	92.3	21.0	100.5	22.9	108.9	92+	Pass
131	11/29/23	Area 1 see sketch	176'	Black 2" max silty sand/organics some gravel (landill mixture) (L-33824)	92.3	21.0	98.9	20.8	107.2	92+	Pass
132	11/29/23	Area 1 see sketch	176'	Black 2" max silty sand/organics some gravel (landill mixture) (L-33824)	92.3	21.0	103.0	18.6	111.6	92+	Pass
133	11/29/23	Area 1 see sketch	176'	Black 2" max silty sand/organics some gravel (landill mixture) (L-33824)	92.3	21.0	106.4	17.0	115.3	92+	Pass
134	11/29/23	Area 2 see sketch	189'	Black 2" max silty sand/organics some gravel (landill mixture) (L-33824)	92.3	21.0	109.7	15.4	118.9	92+	Pass
135	11/29/23	Area 2 see sketch	189'	Black 2" max silty sand/organics some gravel (landill mixture) (L-33824)	92.3	21.0	101.0	17.9	109.4	92+	Pass
Soil Field Testing Notes and/or Observations											

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	November 28, 2023
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Partly cloudy, 30°'s °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:

(3) Dump Trucks
(1) Excavator
(1) Vibratory Roller
(1) Bulldozer

Arriving onsite this morning as scheduled, the undersigned writer met with Mr. Myles Johnson, representing CDM Smith.

A review of the work areas noted that the crew was continuing to place and compact material in the area adjacent to the area to be tested.

During this visit, a total of three (3) nuclear moisture/density readings (tests #123 through #125) were performed. All of the results (except test #123) met the stated 92% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations. The failing test area will be retested at a later date.

It should be noted that a sample taken on a later date was shown to be more applicable and this report was subsequently revised.

Mr. Myles was informed of today's field observation and testing prior to my departure.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Rob Whitt

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

11-28

3	11/2015	JBH	MEJ	UPDATED FOR BIDDING
2	11/2015	MAB	MEJ	REVISED POST-CAPPING UTILITY (NEW WETLANDS MAPPING) AREA
1	4/2015		MEJ	REVISED TO RESPOND TO CONSTRUCTION COMMISSION PEER REVIEW COMMENTS
NO.	DATE	DRWN	CHD	REMARKS

DESIGNED BY: M. MERRARD
DRAWN BY: J. HES
SHEET CHKD BY: C. BAKER
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: MARCH 2015

CDM Smith

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

OVERALL SITE KEY PLAN

PROJECT NO: 6225-113811
FILE NAME: CDGJCYPL.DWG
SHEET NO: G-3

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	**JBS//Andover Ledge Road SLF**	**Project No#**	**26023**
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
121	11/21/23	See Sketch	197'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	125.5	8.4	94.7	92+	Pass
122	11/21/23	See Sketch	197'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	122.6	9.4	92.5	92+	Pass
123	11/28/23	See Sketch	194'	Dark brown 2" max sand little gravel glass trace silt (L-33621)	120.2	7.4	108.3	16.8	90.1	92+	FAIL
124	11/28/23	See Sketch	194'	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	93.7	20.2	101.5	92+	Pass
125	11/28/23	See Sketch	194'	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	93.7	23.7	101.5	92+	Pass
126	11/29/23	Area 1 see sketch	176'	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	98.9	20.5	107.2	92+	Pass
127	11/29/23	Area 1 see sketch	176'	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	104.9	14.3	113.7	92+	Pass
128	11/29/23	Area 1 see sketch	176'	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	94.3	22.8	102.2	92+	Pass
129	11/29/23	Area 1 see sketch	176'	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	95.4	24.8	103.4	92+	Pass
130	11/29/23	Area 1 see sketch	176'	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	100.5	22.9	108.9	92+	Pass
131	11/29/23	Area 1 see sketch	176'	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	98.9	20.8	107.2	92+	Pass
132	11/29/23	Area 1 see sketch	176'	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	103.0	18.6	111.6	92+	Pass
133	11/29/23	Area 1 see sketch	176'	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	106.4	17.0	115.3	92+	Pass
134	11/29/23	Area 2 see sketch	189'	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	109.7	15.4	118.9	92+	Pass
135	11/29/23	Area 2 see sketch	189'	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	101.0	17.9	109.4	92+	Pass
Soil Field Testing Notes and/or Observations											

Field Testing Performed using a Nuclear Moisture Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	November 29, 2023
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Sunny, 30°s °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:

(3) Dump Trucks	(1) Vibratory Roller
(2) Excavators	(1) Bulldozer

Arriving onsite as scheduled, the undersigned observer met with Mr. Myles Johnson, representing CDM Smith.

A review of the work areas found the crew continuing to place and compact material in the area adjacent to the area to be tested.

During this visit, a total of eleven (11) nuclear moisture/density readings (tests #126 through #136) were performed. All of the results met the stated 92% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

It should be noted that a sample taken on a later date was shown to be more applicable, and this report was subsequently revised.

Mr. Myles was informed of today's field observation and testing prior to my departure.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Rob Whitt

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

11-29

REV	DATE	DRWN	CHKD	REMARKS
3	3/2023	JBH	MCJ	UPDATED FOR BIDDING
2	1/2023	KAK	MCJ	PT NORTH POND-CLOSURE SITE/ BOG MATERIALS HANDLING AREA
1	4/2022	JBH	MCJ	REVISED TO REFLECT CONSERVATION COMMISSION COMMENTS

DESIGNED BY: K. HERBERT
DRAWN BY: J. MCJ
SHEET CHK'D BY: C. COMEAU
CADD CHK'D BY: K. JONES
APPROVED BY: M. JONES
DATE: MARCH 2023

CDM Smith
75 Wiggins Avenue, Suite 301
Bedford, MA 01730
Tel (781) 812-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

OVERALL SITE KEY PLAN

PROJECT NO: 5215-11
FILE NAME: CDGJKYPL
SHEET NO: G-3

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
121	11/21/23	See Sketch	197'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	125.5	8.4	94.7	92+	Pass
122	11/21/23	See Sketch	197'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	122.6	9.4	92.5	92+	Pass
123	11/28/23	See Sketch	194'	Dark brown 2" max sand little gravel glass trace silt (L-33621)	120.2	7.4	108.3	16.8	90.1	92+	FAIL
124	11/28/23	See Sketch	194'	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	93.7	20.2	101.5	92+	Pass
125	11/28/23	See Sketch	194'	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	93.7	23.7	101.5	92+	Pass
126	11/29/23	Area 1 see sketch	176'	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	98.9	20.5	107.2	92+	Pass
127	11/29/23	Area 1 see sketch	176'	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	104.9	14.3	113.7	92+	Pass
128	11/29/23	Area 1 see sketch	176'	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	94.3	22.8	102.2	92+	Pass
129	11/29/23	Area 1 see sketch	176'	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	95.4	24.8	103.4	92+	Pass
130	11/29/23	Area 1 see sketch	176'	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	100.5	22.9	108.9	92+	Pass
131	11/29/23	Area 1 see sketch	176'	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	98.9	20.8	107.2	92+	Pass
132	11/29/23	Area 1 see sketch	176'	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	103.0	18.6	111.6	92+	Pass
133	11/29/23	Area 1 see sketch	176'	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	106.4	17.0	115.3	92+	Pass
134	11/29/23	Area 2 see sketch	189'	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	109.7	15.4	118.9	92+	Pass
135	11/29/23	Area 2 see sketch	189'	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	101.0	17.9	109.4	92+	Pass
Soil Field Testing Notes and/or Observations											

Field Testing Performed using a Nuclear Moisture Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
136	11/29/23	Area 2 see sketch	189'	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	104.6	16.4	113.3	92+	Pass
137	11/30/23	First Area	198'	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	129.1	8.6	97.4	92+	Pass
138	11/30/23	First Area	198'	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	128.6	7.3	97.1	92+	Pass
139	11/30/23	First Area	198'	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	129.6	7.9	97.8	92+	Pass
140	11/30/23	First Area	198'	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	131.5	8.4	99.2	92+	Pass
141	11/30/23	Second Area	180'	Dark brown 2" max m/f sand/orga little gravel trace silt (L-33621)	120.2	7.4	120.0	10.9	99.8	92+	Pass
142	11/30/23	Second Area	180'	Dark brown 2" max m/f sand/orga little gravel trace silt (L-33621)	120.2	7.4	119.4	14.1	99.3	92+	Pass
143	11/30/23	Second Area	180'	Dark brown 2" max m/f sand/orga little gravel trace silt (L-33621)	120.2	7.4	118.6	13.8	98.7	92+	Pass
144	11/30/23	Second Area	180'	Dark brown 2" max m/f sand/orga little gravel trace silt (L-33621)	120.2	7.4	117.9	19.2	98.1	92+	Pass
145	12/5/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	125.3	10.8	92.5	90+	Pass
146	12/5/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	124.9	9.5	92.2	90+	Pass
147	12/5/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	124.8	11.5	92.2	90+	Pass
148	12/5/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	124.8	10.6	92.2	90+	Pass
149	12/5/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	123.9	11.8	91.5	90+	Pass
150	12/5/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	123.8	11.3	91.4	90+	Pass

Soil Field Testing Notes and/or Observations	FG = Finish Grade

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	November 30, 2023
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Cloudy, 60° °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:

(2) Bulldozers (3) Dump Trucks
(2) Excavators (2) Vibratory Rollers

Arriving onsite this afternoon as scheduled, the undersigned technician met with Mr. Myles Johnson, representing CDM Smith, and Mr. Mike Bates, the contractor's representative, who indicated the locations to be tested.

A review of the work area found that the first area had been prepared for testing, and that the crew was at work in the second area, placing and compacting material. Below are the coordinates of the perimeter of these areas.

First area:

N: 3069700.02	N: 3069622.07	N: 3069795.07	N: 3069862.36
E: 739208.94	E: 739096.92	E: 739009.77	E: 739118.90
Elev.: 201.420	Elev.: 199.182	Elev.: 195.789	Elev.: 199.598

Second area:

N: 30697533.84	N: 3069905.13	N: 3069882.37	N: 303069750.39
E: 738946.16	E: 738958.67	E: 738897.17	E: 738911.86
Elev.: 177.040	Elev.: 184.001	Elev.: 182.599	Elev.: 173.518

A sample (L-33824) of the landfill deposit was taken, near the excavation area, for laboratory gradation/proctor analyses. The lab results will be forwarded separately upon completion.

During this visit, a total of eight (8) nuclear moisture/density readings (tests #137 through #144) were performed. All of the results met the stated 92% minimum compaction requirement, based on the applied soil proctor values on file, indicating satisfactory compaction at the tested elevations/locations.

Mr. Bates was informed of today's field observation and testing prior to my departure.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet.

Report By: Artur Hoxha

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
136	11/29/23	Area 2 see sketch	189'	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	104.6	16.4	113.3	92+	Pass
137	11/30/23	First Area	198'	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	129.1	8.6	97.4	92+	Pass
138	11/30/23	First Area	198'	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	128.6	7.3	97.1	92+	Pass
139	11/30/23	First Area	198'	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	129.6	7.9	97.8	92+	Pass
140	11/30/23	First Area	198'	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	131.5	8.4	99.2	92+	Pass
141	11/30/23	Second Area	180'	Dark brown 2" max m/f sand/orga little gravel trace silt (L-33621)	120.2	7.4	120.0	10.9	99.8	92+	Pass
142	11/30/23	Second Area	180'	Dark brown 2" max m/f sand/orga little gravel trace silt (L-33621)	120.2	7.4	119.4	14.1	99.3	92+	Pass
143	11/30/23	Second Area	180'	Dark brown 2" max m/f sand/orga little gravel trace silt (L-33621)	120.2	7.4	118.6	13.8	98.7	92+	Pass
144	11/30/23	Second Area	180'	Dark brown 2" max m/f sand/orga little gravel trace silt (L-33621)	120.2	7.4	117.9	19.2	98.1	92+	Pass
145	12/5/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	125.3	10.8	92.5	90+	Pass
146	12/5/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	124.9	9.5	92.2	90+	Pass
147	12/5/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	124.8	11.5	92.2	90+	Pass
148	12/5/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	124.8	10.6	92.2	90+	Pass
149	12/5/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	123.9	11.8	91.5	90+	Pass
150	12/5/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	123.8	11.3	91.4	90+	Pass

Soil Field Testing Notes and/or Observations	FG = Finish Grade

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D 6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	December 5, 2023
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Cloudy, cold, 30°-40° °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
(1) Large Excavator (1) Large Single Drum Vibratory Roller

Arriving onsite this morning as scheduled, the undersigned technician met with Mr. Mike Bates, the project superintendent, who requested compaction testing on the west slope.

A review of the work areas found that the area to be tested had been prepared prior to my arrival.

During this visit, a total of twelve (12) nuclear moisture/density readings (tests #145 through #156) were performed. All of the results met the stated 90% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Mr. Bates was made aware of today's field compaction test results prior to my departure. At that time, he stated that our office would be contacted when further testing is required.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

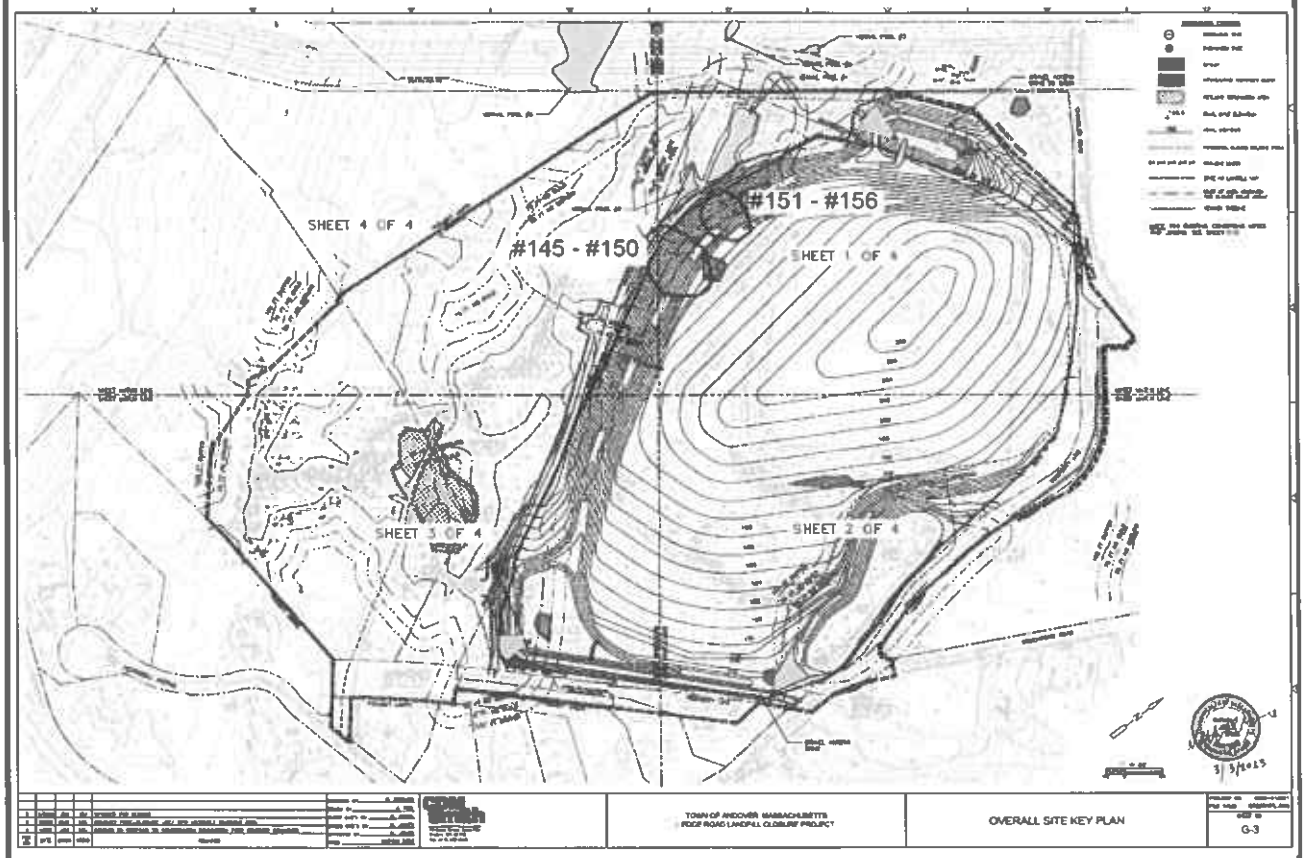
Report By: Anthony Courteau

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

Project Site Field Sketch

Project Name:	JBS//Andover Ledge Road SLF	**Date:**	December 5, 2023
Project Address:	Ledge Road, Andover MA	**Project No.**	26023



TESTING NOTES & OBSERVATIONS:

Sketch may not be to scale

10 Mason Street, Worcester, MA 01609

Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
136	11/29/23	Area 2 see sketch	189'	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	104.6	16.4	113.3	92+	Pass
137	11/30/23	First Area	198'	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	129.1	8.6	97.4	92+	Pass
138	11/30/23	First Area	198'	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	128.6	7.3	97.1	92+	Pass
139	11/30/23	First Area	198'	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	129.6	7.9	97.8	92+	Pass
140	11/30/23	First Area	198'	Dark brown 2" max silty sand/gravel (L-33618)	132.5	6.7	131.5	8.4	99.2	92+	Pass
141	11/30/23	Second Area	180'	Dark brown 2" max m/f sand/orga little gravel trace silt (L-33621)	120.2	7.4	120.0	10.9	99.8	92+	Pass
142	11/30/23	Second Area	180'	Dark brown 2" max m/f sand/orga little gravel trace silt (L-33621)	120.2	7.4	119.4	14.1	99.3	92+	Pass
143	11/30/23	Second Area	180'	Dark brown 2" max m/f sand/orga little gravel trace silt (L-33621)	120.2	7.4	118.6	13.8	98.7	92+	Pass
144	11/30/23	Second Area	180'	Dark brown 2" max m/f sand/orga little gravel trace silt (L-33621)	120.2	7.4	117.9	19.2	98.1	92+	Pass
145	12/5/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	125.3	10.8	92.5	90+	Pass
146	12/5/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	124.9	9.5	92.2	90+	Pass
147	12/5/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	124.8	11.5	92.2	90+	Pass
148	12/5/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	124.8	10.6	92.2	90+	Pass
149	12/5/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	123.9	11.8	91.5	90+	Pass
150	12/5/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	123.8	11.3	91.4	90+	Pass

Soil Field Testing Notes and/or Observations	FG = Finish Grade

Field Testing Performed using a Nuclear Moisture Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
151	12/5/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	123.5	9.2	91.2	90+	Pass
152	12/5/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	123.4	9.8	91.1	90+	Pass
153	12/5/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	125.9	10.3	93.0	90+	Pass
154	12/5/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	123.1	10.8	90.9	90+	Pass
155	12/5/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	123.3	9.9	91.1	90+	Pass
156	12/5/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	123.6	9.7	91.3	90+	Pass
157	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	125.1	10.1	92.4	90+	Pass
158	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	121.9	10.2	90.0	90+	Pass
159	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	124.6	10.1	92.0	90+	Pass
160	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	121.9	9.8	90.0	90+	Pass
161	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	125.4	11.9	92.6	90+	Pass
162	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	123.5	12.4	91.2	90+	Pass
163	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	122.5	11.0	90.5	90+	Pass
164	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	121.9	11.7	90.0	90+	Pass
165	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	122.6	11.7	90.5	90+	Pass

Soil Field Testing Notes and/or Observations	FG = Finish Grade

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	December 6, 2023
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Snow showers, cold, 25°-35° °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
(1) Large Excavator (1) Large Single Drum Vibratory Roller

Arriving onsite this morning as scheduled, the undersigned writer met with Mr. Mike Bates, the project superintendent, who requested compaction testing on the west slope.

A review of the work areas noted that the area to be tested had been prepared prior to my arrival.

During this visit, a total of twenty (20) nuclear moisture/density readings (tests #157 through #176) were performed. All of the results met the stated 90% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Mr. Bates was informed of today's field compaction test results prior to my departure. At that time, he stated that he would contact our office when further testing is required.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Anthony Courteau

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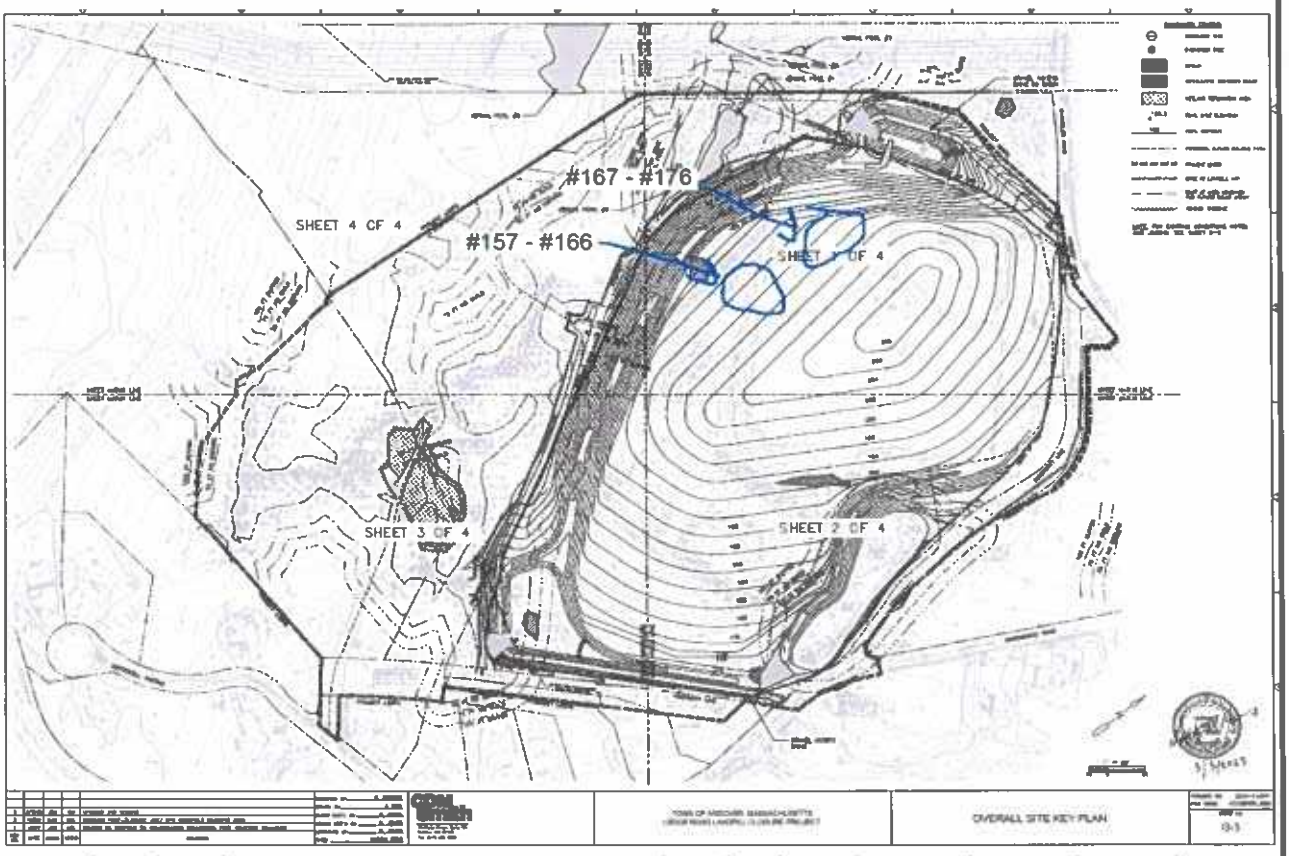
Yankee Engineering and Testing, Inc.

Project Site Field Sketch

Project Name:	JBS//Andover Ledge Road SLF	**Date:**	December 6, 2023
Project Address:	Ledge Road, Andover MA	**Project No.**	26023



TESTING NOTES & OBSERVATIONS:

Sketch may not be to scale

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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	**JBS//Andover Ledge Road SLF**	**Project No#**	**26023**
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
151	12/5/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	123.5	9.2	91.2	90+	Pass
152	12/5/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	123.4	9.8	91.1	90+	Pass
153	12/5/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	125.9	10.3	93.0	90+	Pass
154	12/5/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	123.1	10.8	90.9	90+	Pass
155	12/5/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	123.3	9.9	91.1	90+	Pass
156	12/5/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	123.6	9.7	91.3	90+	Pass
157	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	125.1	10.1	92.4	90+	Pass
158	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	121.9	10.2	90.0	90+	Pass
159	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	124.6	10.1	92.0	90+	Pass
160	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	121.9	9.8	90.0	90+	Pass
161	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	125.4	11.9	92.6	90+	Pass
162	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	123.5	12.4	91.2	90+	Pass
163	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	122.5	11.0	90.5	90+	Pass
164	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	121.9	11.7	90.0	90+	Pass
165	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	122.6	11.7	90.5	90+	Pass

Soil Field Testing Notes and/or Observations	FG = Finish Grade

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
166	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	127.8	11.9	94.4	90+	Pass
167	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	121.9	11.4	90.0	90+	Pass
168	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	122.6	11.9	90.5	90+	Pass
169	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	123.1	11.6	90.9	90+	Pass
170	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	122.2	11.4	90.3	90+	Pass
171	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	122.6	10.1	90.5	90+	Pass
172	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	122.0	11.8	90.1	90+	Pass
173	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	122.3	12.1	90.3	90+	Pass
174	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	121.9	12.5	90.0	90+	Pass
175	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	122.6	11.7	90.5	90+	Pass
176	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	122.1	11.5	90.2	90+	Pass
177	12/7/23	Northeast Cell See Sketch	FG	Black 2" max silty sand/organics some gravel (landill mixture) (L-33824)	92.3	21.0	87.8	20.1	95.1	90+	Pass
178	12/7/23	Northeast Cell See Sketch	FG	Black 2" max silty sand/organics some gravel (landill mixture) (L-33824)	92.3	21.0	89.9	14.1	97.4	90+	Pass
179	12/7/23	Northeast Cell See Sketch	FG	Black 2" max silty sand/organics some gravel (landill mixture) (L-33824)	92.3	21.0	88.7	16.6	96.1	90+	Pass
180	12/7/23	Northeast Cell See Sketch	FG	Black 2" max silty sand/organics some gravel (landill mixture) (L-33824)	92.3	21.0	85.5	18.0	92.6	90+	Pass
Soil Field Testing Notes and/or Observations		FG = Finish Grade									

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	December 7, 2023
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Cloudy, cold, 15°-35° °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
(1) Large Excavator (1) Large Single Drum Vibratory Roller

Arriving onsite this morning as scheduled, the undersigned technician met with Mr. Mike Bates, the project superintendent, who requested compaction testing on the continuing earthwork at the west slope.

A review of the work areas found that the area to be tested had been prepared prior to my arrival.

During this visit, a total of twenty (20) nuclear moisture/density readings (tests #177 through #196) were performed. All of the results met the stated 90% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Mr. Bates was made aware of today's field compaction test results prior to my departure. At that time, he stated that our office would be contacted when further testing is required.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Anthony Courteau

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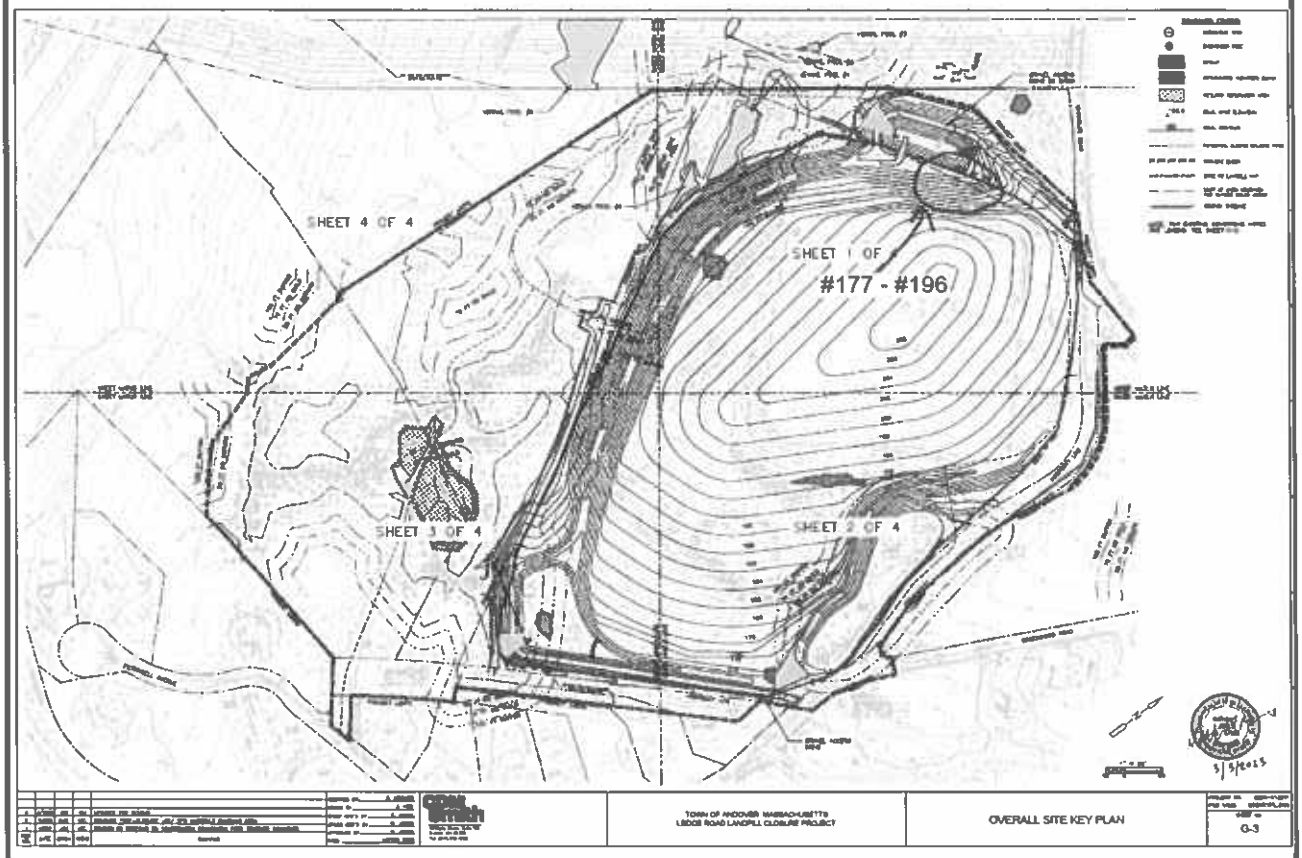
Yankee Engineering and Testing, Inc.

Project Site Field Sketch

Project Name:	JBS//Andover Ledge Road SLF	**Date:**	December 7, 2023
Project Address:	Ledge Road, Andover MA	**Project No.**	26023



TESTING NOTES & OBSERVATIONS:

Sketch may not be to scale

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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
166	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	127.8	11.9	94.4	90+	Pass
167	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	121.9	11.4	90.0	90+	Pass
168	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	122.6	11.9	90.5	90+	Pass
169	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	123.1	11.6	90.9	90+	Pass
170	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	122.2	11.4	90.3	90+	Pass
171	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	122.6	10.1	90.5	90+	Pass
172	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	122.0	11.8	90.1	90+	Pass
173	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	122.3	12.1	90.3	90+	Pass
174	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	121.9	12.5	90.0	90+	Pass
175	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	122.6	11.7	90.5	90+	Pass
176	12/6/23	West Slope See Sketch	FG	Dark brown 2½" max silty gravel and sand (L-33620)	135.4	6.0	122.1	11.5	90.2	90+	Pass
177	12/7/23	Northeast Cell See Sketch	FG	Black 2" max silty sand/organics some gravel (landill mixture) (L-33824)	92.3	21.0	87.8	20.1	95.1	90+	Pass
178	12/7/23	Northeast Cell See Sketch	FG	Black 2" max silty sand/organics some gravel (landill mixture) (L-33824)	92.3	21.0	89.9	14.1	97.4	90+	Pass
179	12/7/23	Northeast Cell See Sketch	FG	Black 2" max silty sand/organics some gravel (landill mixture) (L-33824)	92.3	21.0	88.7	16.6	96.1	90+	Pass
180	12/7/23	Northeast Cell See Sketch	FG	Black 2" max silty sand/organics some gravel (landill mixture) (L-33824)	92.3	21.0	85.5	18.0	92.6	90+	Pass
Soil Field Testing Notes and/or Observations		FG = Finish Grade									

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
181	12/7/23	Northeast Cell See Sketch	FG	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	85.4	19.5	92.5	90+	Pass
182	12/7/23	Northeast Cell See Sketch	FG	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	86.4	14.3	93.6	90+	Pass
183	12/7/23	Northeast Cell See Sketch	FG	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	84.6	21.2	91.7	90+	Pass
184	12/7/23	Northeast Cell See Sketch	FG	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	89.5	15.3	97.0	90+	Pass
185	12/7/23	Northeast Cell See Sketch	FG	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	87.6	13.6	94.9	90+	Pass
186	12/7/23	Northeast Cell See Sketch	FG	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	86.6	20.8	93.8	90+	Pass
187	12/7/23	Northeast Cell See Sketch	FG	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	83.8	23.7	90.8	90+	Pass
188	12/7/23	Northeast Cell See Sketch	FG	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	90.6	18.3	98.2	90+	Pass
189	12/7/23	Northeast Cell See Sketch	FG	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	84.7	19.9	91.8	90+	Pass
190	12/7/23	Northeast Cell See Sketch	FG	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	86.6	17.6	93.8	90+	Pass
191	12/7/23	Northeast Cell See Sketch	FG	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	89.0	14.9	96.4	90+	Pass
192	12/7/23	Northeast Cell See Sketch	FG	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	91.7	16.6	99.3	90+	Pass
193	12/7/23	Northeast Cell See Sketch	FG	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	83.3	18.6	90.2	90+	Pass
194	12/7/23	Northeast Cell See Sketch	FG	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	90.7	16.2	98.3	90+	Pass
195	12/7/23	Northeast Cell See Sketch	FG	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	85.8	17.8	93.0	90+	Pass
Soil Field Testing Notes and/or Observations		FG = Finish Grade									

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	**JBS//Andover Ledge Road SLF**	**Project No#**	**26023**
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
196	12/7/23	Northeast Cell See Sketch	FG	Black 2" max silty sand/organics som gravel (landill mixture) (L-33824)	92.3	21.0	90.8	19.2	98.4	90+	Pass

Soil Field Testing Notes and/or Observations	FG = Finish Grade

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	December 13, 2023
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Sunny, low 40°'s °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:

(1) Excavator
(1) Bulldozer
(3) Dump Trucks
(1) Vibratory Roller

Arriving onsite this morning as scheduled, the undersigned observer met with Mr. Myles Johnson, from CDM Smith.

A review of the work areas noted that the crew continued moving stockpile material and spreading and compacting in adjacent area to test locations. Please refer to the accompanying field sketch for additional information.

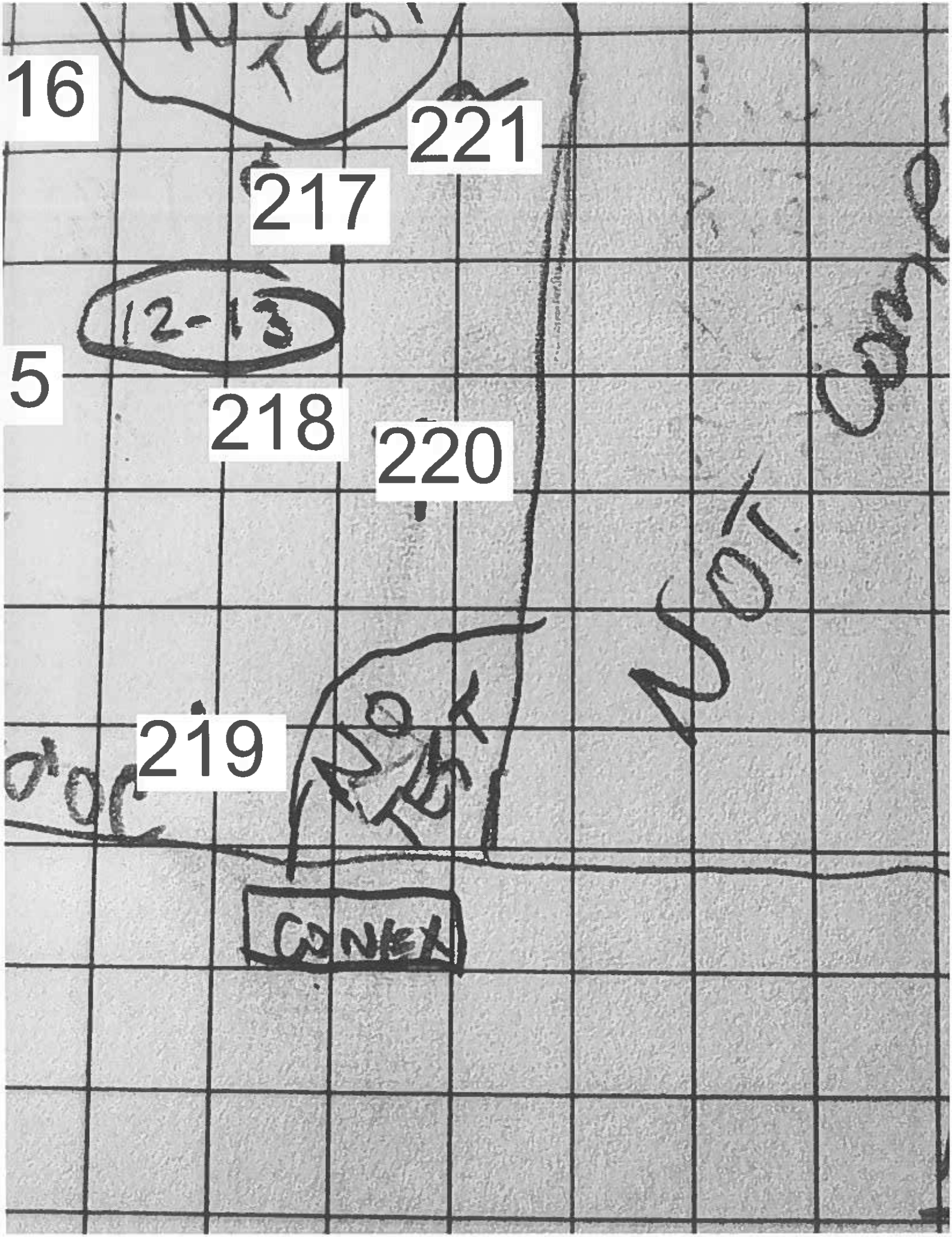
During this visit, a total of eight (8) nuclear moisture/density readings (tests #214 through #221) were performed. All of the results met the stated 90% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Mr. Johnson was informed of today's field compaction test results prior to my departure.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Rob Witt

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
211	11/14/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	125.7	9.3	94.9	92+	Pass
212	11/14/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	123.6	9.9	93.4	92+	Pass
213	11/14/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	132.8	7.9	100.3	92+	Pass
214	12/13/23	See Sketch	200'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	128.8	7.0	107.2	92+	Pass
215	12/13/23	See Sketch	200'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	126.3	7.2	105.1	92+	Pass
216	12/13/23	See Sketch	200'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	120.3	6.2	100.1	92+	Pass
217	12/13/23	See Sketch	200'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	116.6	5.5	97.0	92+	Pass
218	12/13/23	See Sketch	200'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	116.1	7.8	96.6	92+	Pass
219	12/13/23	See Sketch	200'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	120.2	7.4	112.6	9.2	93.7	92+	Pass
220	12/13/23	See Sketch	200'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	112.4	7.1	93.5	92+	Pass
221	12/13/23	See Sketch	200'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	120.6	5.9	100.3	92+	Pass
222	12/15/23	See Sketch	196'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	95.2	20.2	103.1	92+	Pass
223	12/15/23	See Sketch	196'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	111.4	16.7	92.7	92+	Pass
224	12/15/23	See Sketch	196'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	94.9	16.1	102.8	92+	Pass
225	12/15/23	See Sketch	196'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	110.9	17.6	92.3	92+	Pass
Soil Field Testing Notes and/or Observations											

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	December 14, 2023
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Mostly sunny, 20°-40° °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating During Visit:
NONE

Arriving onsite this afternoon as scheduled, the undersigned technician met with the contractor's representative, who stated that compaction testing would not be needed on this date. At that time, he stated that he would contact our office to reschedule.

Report By: Artur Hoxha

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	December 15, 2023
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Sunny, low 50°'s °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:

(1) Excavator
(1) Bulldozer
(2) Dump Trucks
(1) Vibratory Roller

Arriving onsite this morning as scheduled, the undersigned technician met with Mr. Myles Johnson, the CDM representative.

A review of the work areas noted that the crew was reworking an area that had organic materials. This material was then taken offsite.

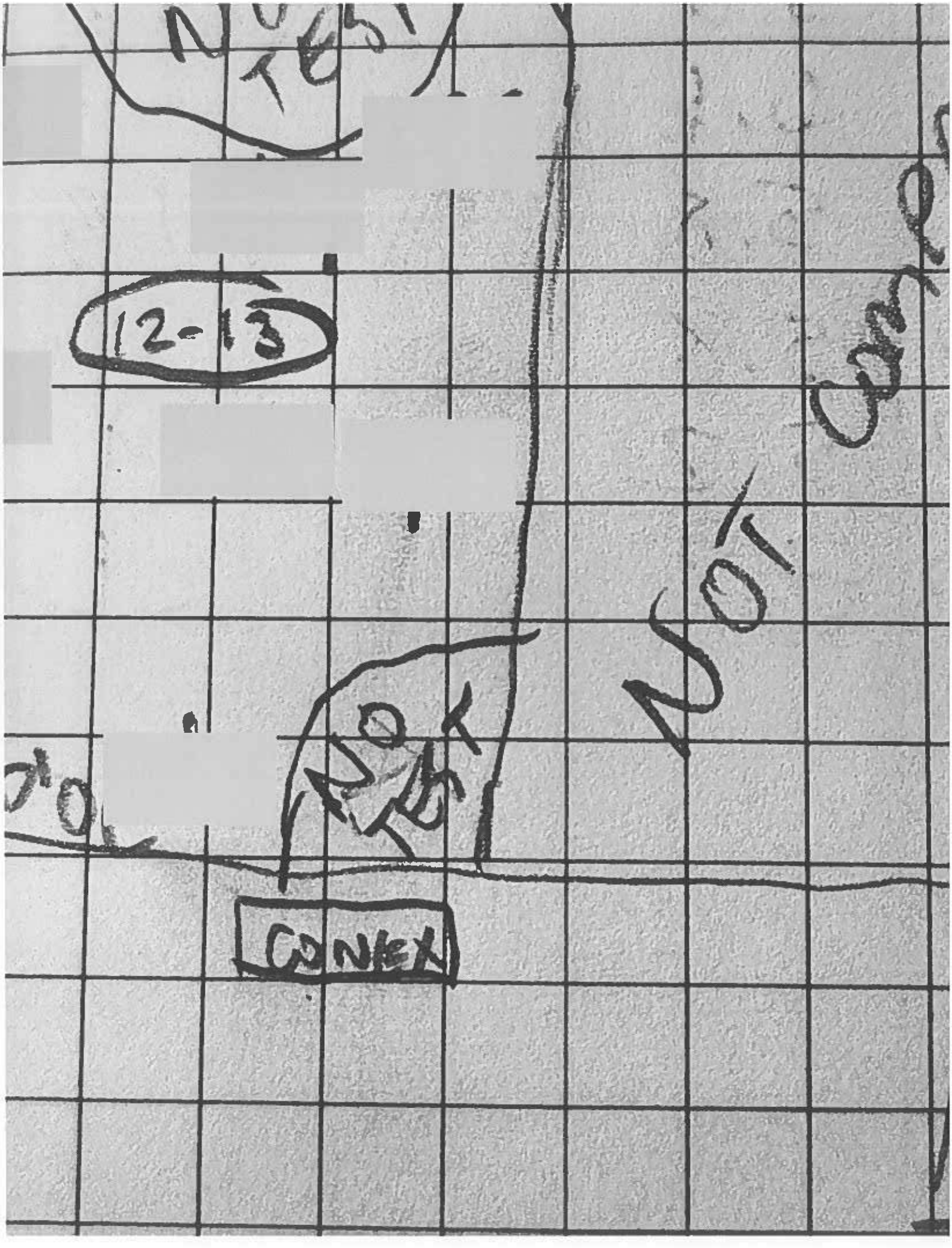
During this visit, a total of thirteen (13) nuclear moisture/density readings (tests #222 through #234) were performed. All of the results met the stated 90% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Mr. Johnson was made aware of today's field compaction test results prior to my departure.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Rob Witt

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	**JBS//Andover Ledge Road SLF**	**Project No#**	**26023**
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
211	11/14/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	125.7	9.3	94.9	92+	Pass
212	11/14/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	123.6	9.9	93.4	92+	Pass
213	11/14/23	See Sketch	194'	Dark brown 3" max sand and gravel trace silt (L-33619)	132.4	6.0	132.8	7.9	100.3	92+	Pass
214	12/13/23	See Sketch	200'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	128.8	7.0	107.2	92+	Pass
215	12/13/23	See Sketch	200'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	126.3	7.2	105.1	92+	Pass
216	12/13/23	See Sketch	200'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	120.3	6.2	100.1	92+	Pass
217	12/13/23	See Sketch	200'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	116.6	5.5	97.0	92+	Pass
218	12/13/23	See Sketch	200'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	116.1	7.8	96.6	92+	Pass
219	12/13/23	See Sketch	200'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	120.2	7.4	112.6	9.2	93.7	92+	Pass
220	12/13/23	See Sketch	200'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	112.4	7.1	93.5	92+	Pass
221	12/13/23	See Sketch	200'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	120.6	5.9	100.3	92+	Pass
222	12/15/23	See Sketch	196'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	95.2	20.2	103.1	92+	Pass
223	12/15/23	See Sketch	196'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	111.4	16.7	92.7	92+	Pass
224	12/15/23	See Sketch	196'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	94.9	16.1	102.8	92+	Pass
225	12/15/23	See Sketch	196'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	110.9	17.6	92.3	92+	Pass
Soil Field Testing Notes and/or Observations											

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	**JBS//Andover Ledge Road SLF**	**Project No#**	**26023**
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
226	12/15/23	See Sketch	196'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	110.8	20.5	92.2	92+	Pass
227	12/15/23	See Sketch	196'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	93.8	19.5	101.6	92+	Pass
228	12/15/23	See Sketch	196'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	111.3	13.3	92.6	92+	Pass
229	12/15/23	See Sketch	196'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	96.3	13.7	104.3	92+	Pass
230	12/15/23	See Sketch	196'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.9	21.8	95.2	92+	Pass
231	12/15/23	See Sketch	196'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	96.1	19.0	104.1	92+	Pass
232	12/15/23	See Sketch	196'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	110.7	11.7	92.1	92+	Pass
233	12/15/23	See Sketch	196'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	111.5	14.6	92.8	92+	Pass
234	12/15/23	See Sketch	196'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	111.8	18.8	93.0	92+	Pass
235	12/21/23	SLF North Center	8' BFG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	88.2	16.6	95.6	92+	Pass
236	12/21/23	SLF North Center	8' BFG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	89.9	19.3	97.4	92+	Pass
237	12/21/23	SLF North Center	8' BFG	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	111.4	16.6	92.7	92+	Pass
238	12/21/23	SLF North Center	8' BFG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	90.1	15.1	97.6	92+	Pass

Soil Field Testing Notes and/or Observations	BFG = Below Finish Grade

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	December 21, 2023
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Mostly sunny, 25°-35° °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:

(2) Bulldozers
(2) Excavators
(1) Bulldozer
(1) Large Riding Vibratory Roller
(2) Dump Trucks

Arriving onsite this morning as scheduled, the undersigned technician met with Mr. Myles Johnson, the project superintendent, and Mr. Mike Bates, the project soil foreman, who stated that a 40–50 year old landfill had been closed and capped, and that the current project was to remove the existing cap, regrade, and replace the cap.

It was further stated that landfill contents were being excavated from the southeast and delivered to a fill area at the north center. It was reported that the current elevation of the fill area was 195', 8'± below the proposed new cap.

Throughout this visit, the crew placed and compacted, with several passes of the riding vibratory roller, in a crossing pattern, 1' lifts of the abovementioned material. The material appeared slightly to moderately unstable, with some soil displacement and weaving observed. It should be noted that 2'-3' logs/tree trunks and boulders were culled out during placement and prior to compaction.

During this visit, a total of four (4) nuclear moisture/density readings (tests #235 through #238) were performed. All of the results met the stated 90% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Mr. Johnson was notified of today's field compaction test results prior to my departure.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet.

Report By: Rick McCarthy

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	**JBS//Andover Ledge Road SLF**	**Project No#**	**26023**
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
226	12/15/23	See Sketch	196'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	110.8	20.5	92.2	92+	Pass
227	12/15/23	See Sketch	196'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	93.8	19.5	101.6	92+	Pass
228	12/15/23	See Sketch	196'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	111.3	13.3	92.6	92+	Pass
229	12/15/23	See Sketch	196'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	96.3	13.7	104.3	92+	Pass
230	12/15/23	See Sketch	196'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.9	21.8	95.2	92+	Pass
231	12/15/23	See Sketch	196'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	96.1	19.0	104.1	92+	Pass
232	12/15/23	See Sketch	196'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	110.7	11.7	92.1	92+	Pass
233	12/15/23	See Sketch	196'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	111.5	14.6	92.8	92+	Pass
234	12/15/23	See Sketch	196'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	111.8	18.8	93.0	92+	Pass
235	12/21/23	SLF North Center	8' BFG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	88.2	16.6	95.6	92+	Pass
236	12/21/23	SLF North Center	8' BFG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	89.9	19.3	97.4	92+	Pass
237	12/21/23	SLF North Center	8' BFG	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	111.4	16.6	92.7	92+	Pass
238	12/21/23	SLF North Center	8' BFG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	90.1	15.1	97.6	92+	Pass

Soil Field Testing Notes and/or Observations	BFG = Below Finish Grade

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	January 2, 2024
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Sunny, cold, 20°'s °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
(1) Bulldozer (2) Site Dump Trucks
(2) Excavators

Arriving onsite this morning as scheduled, the undersigned writer met with Mr. Myles Johnson, the project superintendent, and Mr. Mike Bates, the project soil foreman, who stated that a 40–50 year-old landfill had been closed and capped, and that the current project was to remove the existing cap, regrade, and replace the cap.

A review of the work areas found that; prior to my arrival, the crew had placed and compacted two (2) 12"± lifts of black 2" max silty sand/organics/gravel. The lifts were noted somewhat uniformly graded, moderately stable, and considerably moist to wet.

During this visit, a total of twenty-two (22) nuclear moisture/density readings (tests #239 through #260) were performed. All of the results (except tests #242, #253, #256, #257, and #260) met the stated 92% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

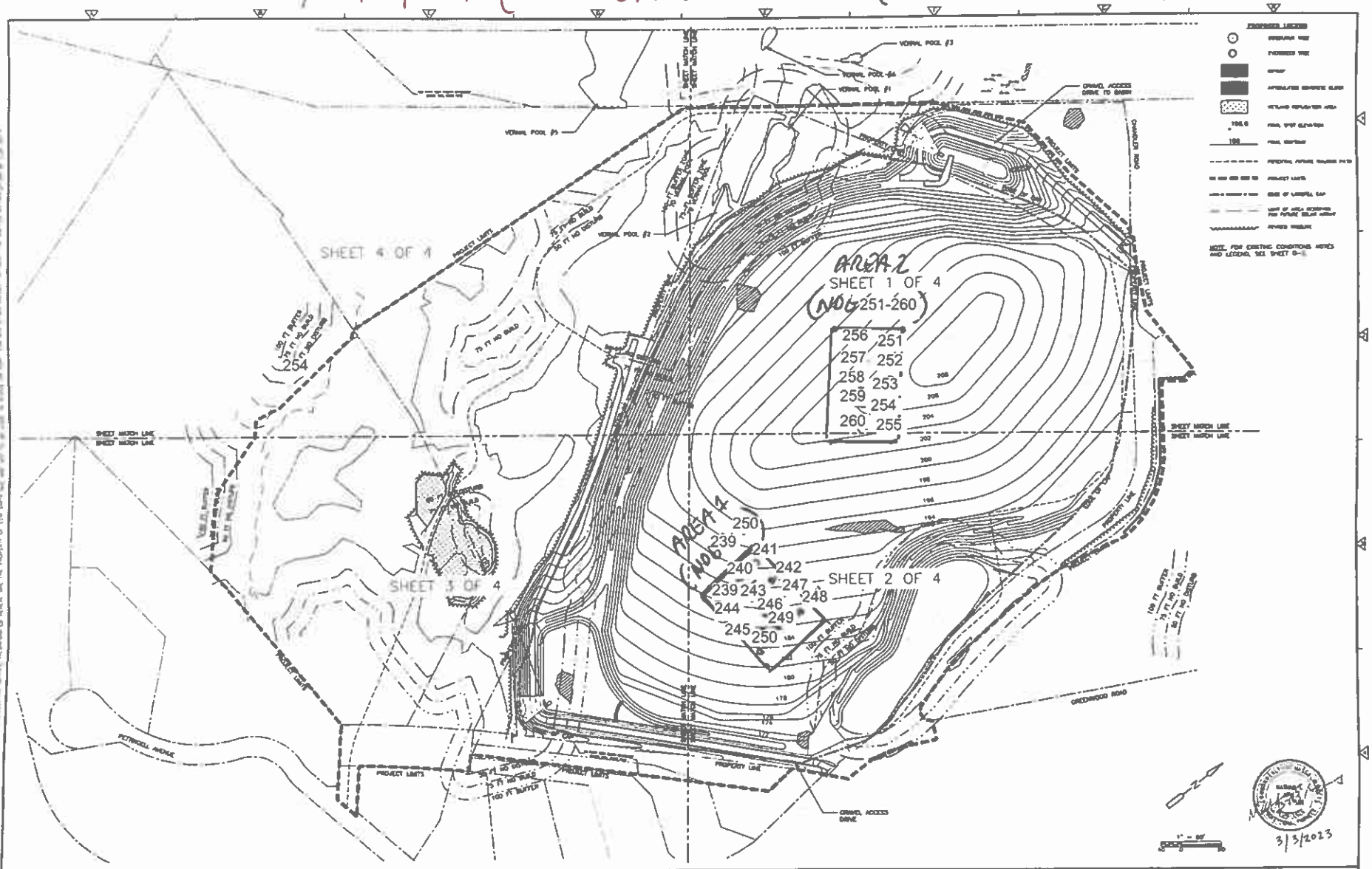
Mr. Bates was informed of today's field compaction test results prior to my departure.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: John Durant

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

JOB# 26023 JB// LEDGE RD. SLF ANDOVER
TUESDAY 01/02/2024 (NOG SOIL TESTS AT 6" AREA #1 (1-12) AREA #2 (13-22)



NO.	DATE	BY	CHKD	REMARKS
2	3/2023	JMH	KEJ	UPDATED FOR BIDDING
1	11/2022	AMH	KEJ	REVISED PER CLOSURE USE/ DPH MATERIALS HANDLING AREA
0	9/2021	JMH	KEJ	REVISED TO RESPOND TO CONSERVATION COMMISSION PEER REVIEW COMMENTS

DESIGNED BY: K. HOWARD
DRAWN BY: J. HITE
SHEET CHK'D BY: C. CARELL
CHKD CHK'D BY: K. JONES
APPROVED BY: K. JONES
DATE: MARCH 2021

CDM Smith

TOWN OF ANDOVER MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

OVERALL SITE KEY PLAN

PROJECT NO. 6039-11.3011
FILE NAME C003KYPL.DWG
SHEET NO. G-3

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
226	12/15/23	See Sketch	196'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	110.8	20.5	92.2	92+	Pass
227	12/15/23	See Sketch	196'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	93.8	19.5	101.6	92+	Pass
228	12/15/23	See Sketch	196'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	111.3	13.3	92.6	92+	Pass
229	12/15/23	See Sketch	196'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	96.3	13.7	104.3	92+	Pass
230	12/15/23	See Sketch	196'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.9	21.8	95.2	92+	Pass
231	12/15/23	See Sketch	196'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	96.1	19.0	104.1	92+	Pass
232	12/15/23	See Sketch	196'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	110.7	11.7	92.1	92+	Pass
233	12/15/23	See Sketch	196'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	111.5	14.6	92.8	92+	Pass
234	12/15/23	See Sketch	196'	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	111.8	18.8	93.0	92+	Pass
235	12/21/23	SLF North Center	8' BFG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	88.2	16.6	95.6	92+	Pass
236	12/21/23	SLF North Center	8' BFG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	89.9	19.3	97.4	92+	Pass
237	12/21/23	SLF North Center	8' BFG	Dark brown 2" max sand little gravel/glass trace silt (L-33621)	120.2	7.4	111.4	16.6	92.7	92+	Pass
238	12/21/23	SLF North Center	8' BFG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	90.1	15.1	97.6	92+	Pass
239	1/2/24	Area 1 See Sketch	183.1'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	103.3	18.9	111.9	92+	Pass
240	1/2/24	Area 1 See Sketch	183.1'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	104.3	15.6	113.0	92+	Pass
Soil Field Testing Notes and/or Observations	BFG = Below Finish Grade										

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
241	1/2/24	Area 1 see sketch	183.1'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	100.5	19.9	108.9	92+	Pass
242	1/2/24	Area 1 see sketch	183.1'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	84.9	26.7	92.0	92+	Pass
243	1/2/24	Area 1 see sketch	183.1'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.9	25.8	94.1	92+	Pass
244	1/2/24	Area 1 see sketch	183.1'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	99.6	20.1	107.9	92+	Pass
245	1/2/24	Area 1 see sketch	183.1'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	92.7	22.8	100.4	92+	Pass
246	1/2/24	Area 1 see sketch	183.1'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	94.9	19.1	102.8	92+	Pass
247	1/2/24	Area 1 see sketch	183.1'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	91.6	21.9	99.2	92+	Pass
248	1/2/24	Area 1 see sketch	183.1'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	99.8	18.5	108.1	92+	Pass
249	1/2/24	Area 1 see sketch	183.1'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	90.8	24.8	98.4	92+	Pass
250	1/2/24	Area 1 see sketch	183.1'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	88.8	23.3	96.2	92+	Pass
251	1/2/24	Area 2 see sketch	195.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	96.9	22.8	105.0	92+	Pass
252	1/2/24	Area 2 see sketch	195.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	96.9	21.3	105.0	92+	Pass
253	1/2/24	Area 2 see sketch	195.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	80.1	32.5	86.8	92+	FAIL
254	1/2/24	Area 2 see sketch	195.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	92.3	25.2	100.0	92+	Pass
255	1/2/24	Area 2 see sketch	195.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	91.4	24.7	99.0	92+	Pass
Soil Field Testing Notes and/or Observations											

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	**JBS//Andover Ledge Road SLF**	**Project No#**	**26023**
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
256	1/2/24	Area 2 see sketch	195.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	79.1	24.4	85.7	92+	FAIL
257	1/2/24	Area 2 see sketch	195.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	84.0	30.3	91.0	92+	FAIL
258	1/2/24	Area 2 see sketch	195.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	88.4	27.8	95.8	92+	Pass
259	1/2/24	Area 2 see sketch	195.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	90.8	25.3	98.4	92+	Pass
260	1/2/24	Area 2 see sketch	195.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	82.0	29.3	88.8	92+	FAIL
261	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.5	27.6	92.6	90+	Pass
262	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	83.9	25.8	90.9	90+	Pass
263	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.6	21.1	92.7	90+	Pass
264	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.7	25.8	95.0	90+	Pass
265	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	90.5	25.1	98.0	90+	Pass
266	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	84.0	25.1	91.0	90+	Pass
267	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	84.7	19.6	91.8	90+	Pass
268	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	84.0	22.4	91.0	90+	Pass
269	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.1	19.2	92.2	90+	Pass
270	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.6	29.8	93.8	90+	Pass

Soil Field Testing Notes and/or Observations	FG = Finish Grade

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	January 4, 2024
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Cloudy, cold, 30°-40° °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
(1) Excavator
(2) Bulldozers
(1) Large Single Drum Vibratory Roller

Arriving onsite this morning as scheduled, the undersigned observer met with Mr. Mike Bates, the project superintendent, who requested compaction testing on the south slope.

A review of the work areas found that; prior to my arrival, the crew had prepared the south slope area for testing.

During this visit, a total of twenty (20) nuclear moisture/density readings (tests #261 through #280) were performed. All of the results (except for test #274) met the stated 90% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Mr. Bates was made aware of today's field compaction test results prior to my departure. At that time, he stated that our office would be contacted when further testing is required.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Anthony Courteau

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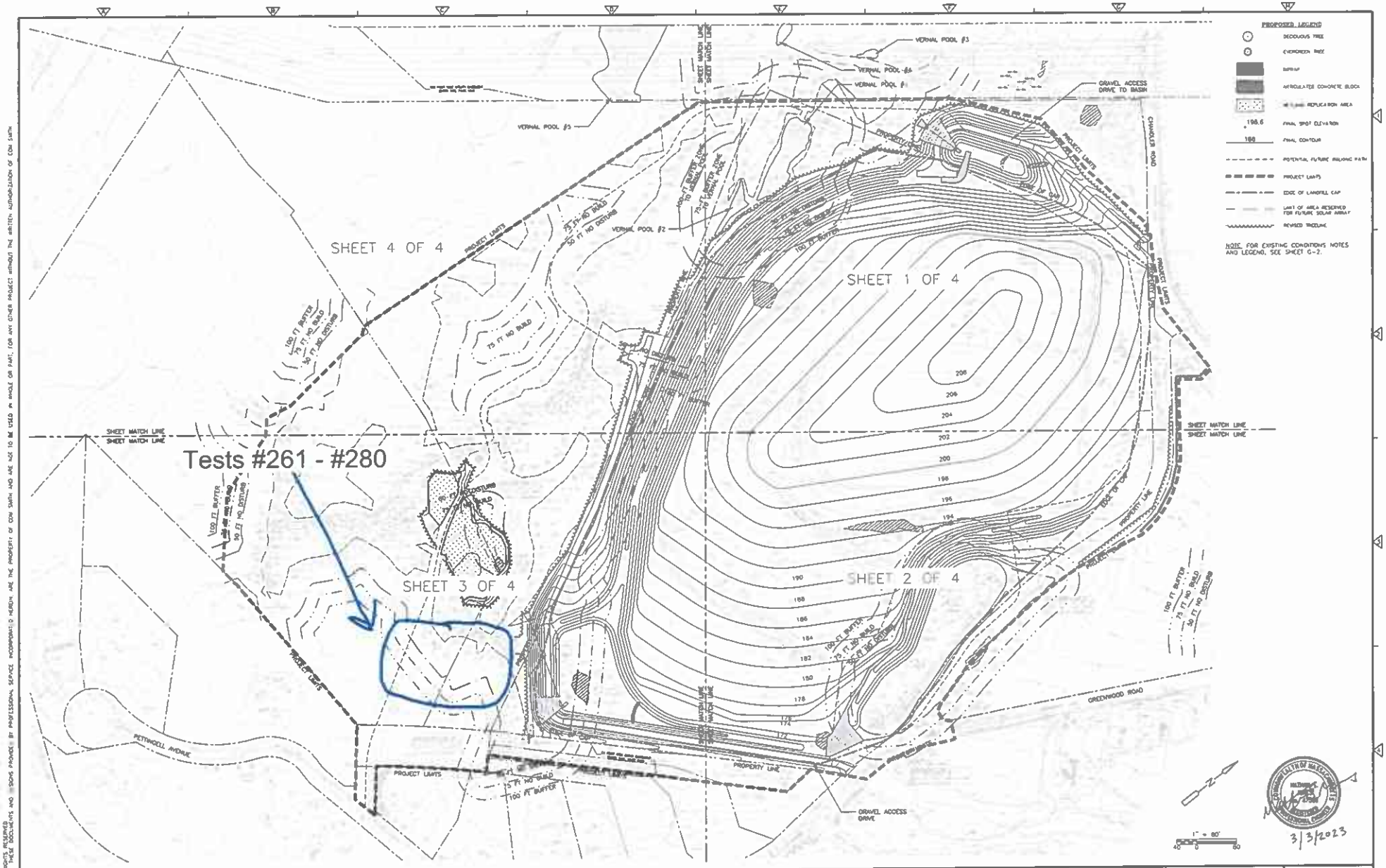
Phone (508) 831-7404 • Fax (508) 831-7388



REV NO.	DATE	DRWN	CHKD	REMARKS
3	3/2023	JBH	MCJ	UPDATED FOR BIDDING
2	11/2022	RAB	MCJ	REMOVED POST-CLOSURE USE/ DPW MATERIALS HANDLING AREA
1	4/2022	JBH	MCJ	REVISED TO RESPOND TO CONSERVATION COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY C. HOWARD
DRAWN BY J. MEA
SHEET CHK'D BY C. DANIEL
CROSS CHK'D BY N. JONES
APPROVED BY N. JONES
DATE MARCH 2023

CDM Smith
75 State Street Suite 701
Boston, MA 02109
Tel 617-452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

OVERALL SITE KEY PLAN

PROJECT NO 0235-113811
FILE NAME C:\DO\SKYPL.DWG
SHEET NO G-3

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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	**JBS//Andover Ledge Road SLF**	**Project No#**	**26023**
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
256	1/2/24	Area 2 see sketch	195.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	79.1	24.4	85.7	92+	FAIL
257	1/2/24	Area 2 see sketch	195.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	84.0	30.3	91.0	92+	FAIL
258	1/2/24	Area 2 see sketch	195.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	88.4	27.8	95.8	92+	Pass
259	1/2/24	Area 2 see sketch	195.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	90.8	25.3	98.4	92+	Pass
260	1/2/24	Area 2 see sketch	195.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	82.0	29.3	88.8	92+	FAIL
261	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.5	27.6	92.6	90+	Pass
262	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	83.9	25.8	90.9	90+	Pass
263	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.6	21.1	92.7	90+	Pass
264	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.7	25.8	95.0	90+	Pass
265	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	90.5	25.1	98.0	90+	Pass
266	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	84.0	25.1	91.0	90+	Pass
267	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	84.7	19.6	91.8	90+	Pass
268	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	84.0	22.4	91.0	90+	Pass
269	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.1	19.2	92.2	90+	Pass
270	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.6	29.8	93.8	90+	Pass

Soil Field Testing Notes and/or Observations	FG = Finish Grade

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
271	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.6	25.9	93.8	90+	Pass
272	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.5	27.7	92.6	90+	Pass
273	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	83.8	26.9	90.8	90+	Pass
274	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	83.0	28.3	89.9	90+	FAIL
275	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	89.9	25.3	97.4	90+	Pass
276	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	91.5	27.4	99.1	90+	Pass
277	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	83.9	19.6	90.9	90+	Pass
278	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	88.7	23.5	96.1	90+	Pass
279	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	83.9	21.0	90.9	90+	Pass
280	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	84.0	22.6	91.0	90+	Pass

Soil Field Testing Notes and/or Observations	FG = Finish Grade

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	January 22, 2024
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Sunny, 20°'s °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
(2) Excavators
(1) Bulldozer
(1) Single Drum Vibratory Roller

Arriving onsite this morning as scheduled, the undersigned observer met with Mr. Mike Bates, the project foreman.

A review of the work areas found that; prior to my arrival, the crew had removed frost and snow before placing and compacting black 2" max silty sand/organics/gravel material.

During this visit, a total of seven (7) nuclear moisture/density readings (tests #281 through #287) were performed. All of the results met the stated 92% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Mr. Bates was made aware of today's field compaction test results prior to my departure.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Ryan McConville

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24023 01-22-24

3	1/30/23	JBH	MJ	UPDATED FOR REVIEW	DESIGNED BY	T. McDonald	
2	11/18/22	JBH	MJ	REVISED PER CLOSURE MTG // 7TH MATERIALS VOLUME ADDED	DRAWN BY	J. Hill	
1	9/9/21	JBH	MJ	REVISED TO REFLECT 3D CONSTRUCTION QUANTITIES FOR REVISED CLOSURE	CHECKED BY	C. Smith	
NO.	BY	CHKD		REMARKS	APPROVED BY	T. McDonald	
					DATE	MARCH 2023	

CDM Smith

TOWN OF ANDOVER MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

OVERALL SITE KEY PLAN

PROJECT NO. 3239-113011
FILE NAME: G003KEYPLOVRC
SHEET NO. G-3

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
271	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.6	25.9	93.8	90+	Pass
272	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.5	27.7	92.6	90+	Pass
273	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	83.8	26.9	90.8	90+	Pass
274	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	83.0	28.3	89.9	90+	FAIL
275	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	89.9	25.3	97.4	90+	Pass
276	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	91.5	27.4	99.1	90+	Pass
277	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	83.9	19.6	90.9	90+	Pass
278	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	88.7	23.5	96.1	90+	Pass
279	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	83.9	21.0	90.9	90+	Pass
280	1/4/24	South Slope see sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	84.0	22.6	91.0	90+	Pass
281	1/22/24	See Sketch	200.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	91.4	21.3	99.0	92+	Pass
282	1/22/24	See Sketch	200'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.9	20.1	93.1	92+	Pass
283	1/22/24	See Sketch	200'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.7	22.0	92.8	92+	Pass
284	1/22/24	See Sketch	200'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.9	21.1	94.1	92+	Pass
285	1/22/24	See Sketch	200'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.0	20.9	93.2	92+	Pass

Soil Field Testing Notes and/or Observations	FG = Finish Grade

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
286	1/22/24	See Sketch	200'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.8	22.0	95.1	92+	Pass
287	1/22/24	See Sketch	200'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	84.9	20.1	92.0	92+	Pass

Soil Field Testing Notes and/or Observations

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	February 14, 2024
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Sunny, cold, 25°-30° °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
(1) Excavator
(2) Bulldozers
(1) Large Single Drum Vibratory Roller

Arriving onsite this morning as scheduled, the undersigned technician met with Mr. Mike Bates, the project superintendent, who requested compaction testing on the northwest slope and south roadway.

A review of the work areas found that; prior to my arrival, the crew had prepared the abovementioned areas for testing.

During this visit, a total of twenty (20) nuclear moisture/density readings (tests #288 through #307) were performed. All of the results met the stated 90%-95% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Mr. Bates was informed of today's field compaction test results prior to my departure.

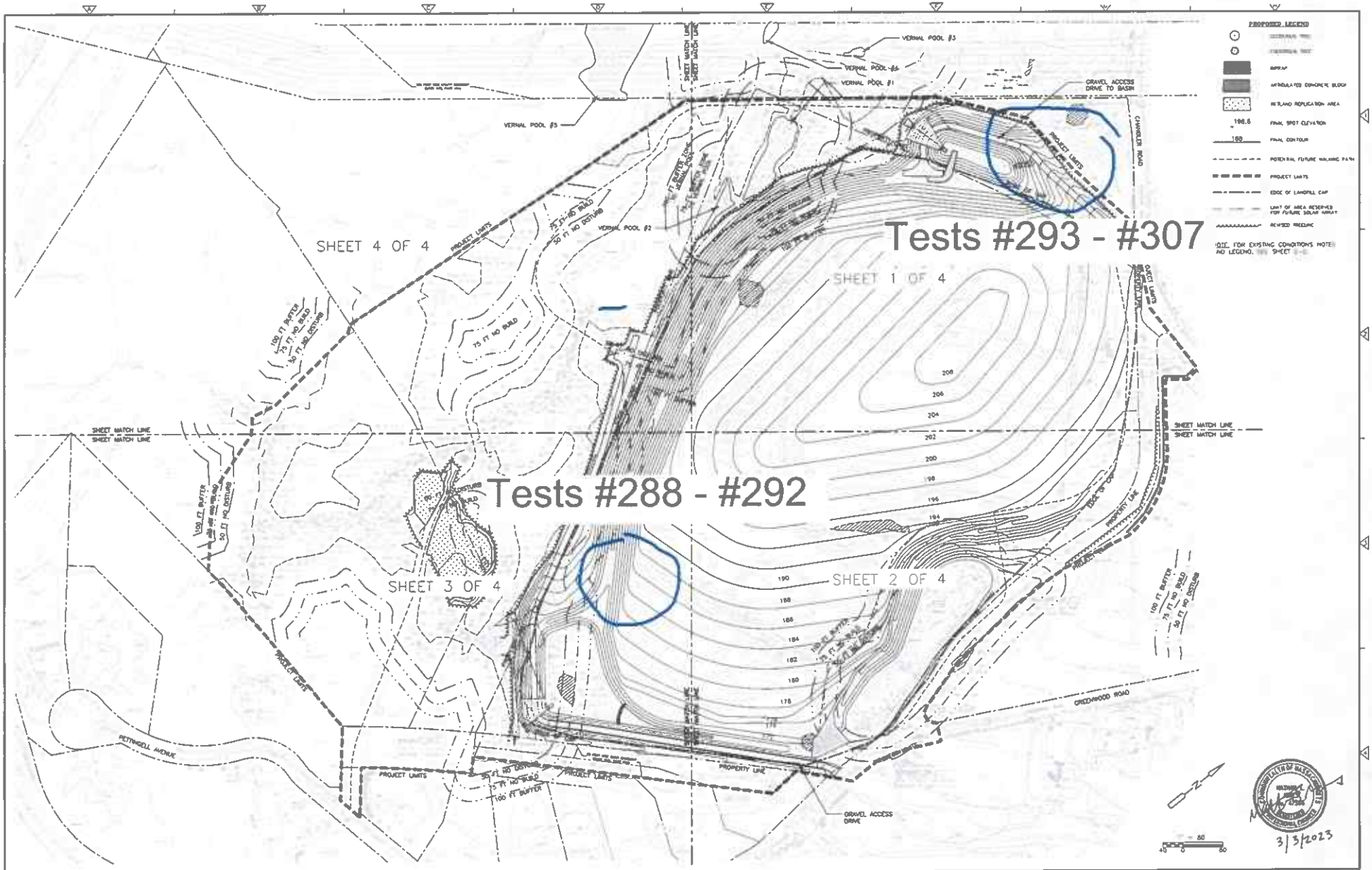
For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Anthony Courteau

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

26023 Andover SLF

02/14/24



REV NO.	DATE	DRWN	CHKD	REMARKS
3	3/2023	JBH	MCJ	UPDATED FOR BIDDING
2	11/2022	KAB	MCJ	REMOVED POST-CLOSURE USE/ DPW MATERIALS HANDLING AREA
1	6/2022	JBH	MCJ	REVISED TO RESPOND TO CONSERVATION COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY: S. HOWARD
DRAWN BY: J. MCL
SHEET CHK'D BY: C. CAREL
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: MARCH 2023

CDM Smith

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

OVERALL SITE KEY PLAN

PROJECT NO. 0239-[illegible]
FILE NAME: C00G3KYPL.DWG
SHEET NO. G-3

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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
286	1/22/24	See Sketch	200'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.8	22.0	95.1	92+	Pass
287	1/22/24	See Sketch	200'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	84.9	20.1	92.0	92+	Pass
288	2/14/24	South Road See Sketch	FG	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	128.3	11.0	96.8	95+	Pass
289	2/14/24	South Road See Sketch	FG	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	127.4	11.0	96.2	95+	Pass
290	2/14/24	South Road See Sketch	FG	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	127.1	11.8	95.9	95+	Pass
291	2/14/24	South Road See Sketch	FG	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	128.8	11.8	97.2	95+	Pass
292	2/14/24	South Road See Sketch	FG	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	131.2	11.0	99.0	95+	Pass
293	2/14/24	Northwest Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.8	20.8	95.1	90+	Pass
294	2/14/24	Northwest Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	88.0	18.4	95.3	90+	Pass
295	2/14/24	Northwest Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.0	19.3	92.1	90+	Pass
296	2/14/24	Northwest Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.9	18.2	95.2	90+	Pass
297	2/14/24	Northwest Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	88.0	16.4	95.3	90+	Pass
298	2/14/24	Northwest Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.0	22.5	93.2	90+	Pass
299	2/14/24	Northwest Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	88.8	21.2	96.2	90+	Pass
300	2/14/24	Northwest Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.9	17.6	94.1	90+	Pass
Soil Field Testing Notes and/or Observations	FG = Finish Grade										

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
301	2/14/24	Northwest Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.4	14.4	94.7	90+	Pass
302	2/14/24	Northwest Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	89.0	19.5	96.4	90+	Pass
303	2/14/24	Northwest Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	84.4	21.0	91.4	90+	Pass
304	2/14/24	Northwest Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.9	15.1	94.1	90+	Pass
305	2/14/24	Northwest Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.8	22.3	93.0	90+	Pass
306	2/14/24	Northwest Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	84.8	18.7	91.9	90+	Pass
307	2/14/24	Northwest Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.4	20.6	93.6	90+	Pass
308	2/19/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	89.1	22.9	96.5	90+	Pass
309	2/19/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.3	26.1	92.4	90+	Pass
310	2/19/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.8	22.5	95.1	90+	Pass
311	2/19/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.8	22.5	95.1	90+	Pass
312	2/19/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.5	17.9	92.6	90+	Pass
313	2/19/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	83.2	18.3	90.1	90+	Pass
314	2/19/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.1	18.9	94.4	90+	Pass
315	2/19/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.0	22.5	93.2	90+	Pass
Soil Field Testing Notes and/or Observations		FG = Finish Grade									

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	February 19, 2024
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Sunny, cold, 25°-35° °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
(1) Excavator
(2) Bulldozers
(1) Large Single Drum Vibratory Roller

Arriving onsite this morning as scheduled, the undersigned writer met with Mr. Mike Bates, the project superintendent, who requested compaction testing on the west and south slopes.

A review of the work areas found that; prior to my arrival, the crew had prepared the abovementioned areas for testing.

During this visit, a total of twenty (20) nuclear moisture/density readings (tests #308 through #327) were performed. All of the results met the stated 90% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Mr. Bates was notified of today's field compaction test results prior to my departure.

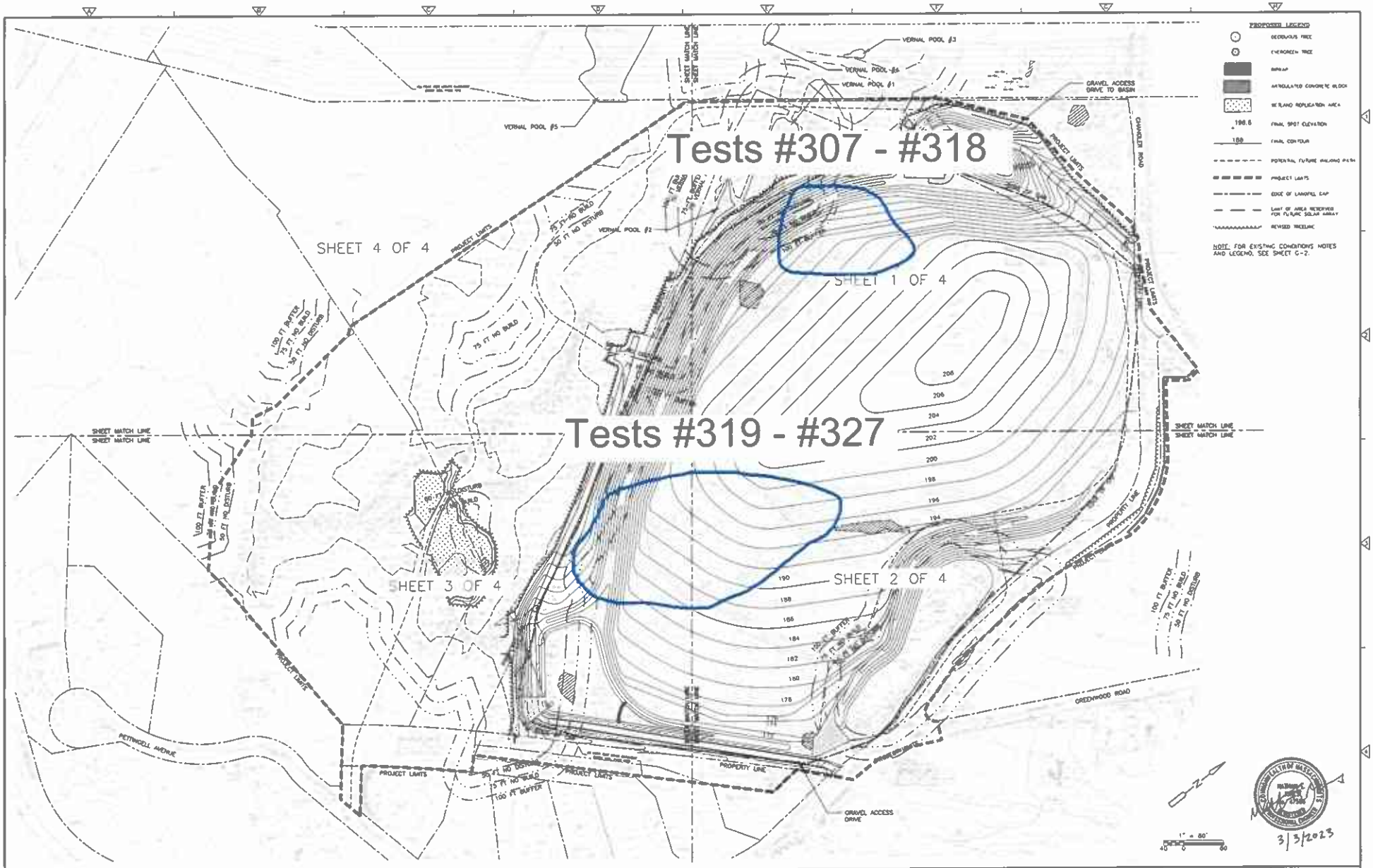
For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Anthony Courteau

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

26023 Andover SLF

02/19/24



REV NO	DATE	DRWN	CHKD	REMARKS
3	3/2023	JBH	MEJ	UPDATED FOR BIDDING
2	11/2022	KAR	MEJ	REMOVED POST-CLOSURE USE/ DPW MATERIALS HANDLING AREA
1	4/2023	JBH	MEJ	REVISED TO RESPOND TO CONSERVATION COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY: C. HOWARD
DRAWN BY: J. MEJ
SHEET CHKD BY: C. CARD
CROSS CHKD BY: H. JONES
APPROVED BY: H. JONES
DATE: MARCH 2023

CDM Smith
75 State Street Suite 701
Boston, MA 02109
Tel 617-452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

OVERALL SITE KEY PLAN

PROJECT NO 02255-113811
FILE NAME: D00SHTPL.DWG
SHEET NO
G-3

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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	**JBS//Andover Ledge Road SLF**	**Project No#**	**26023**
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
301	2/14/24	Northwest Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.4	14.4	94.7	90+	Pass
302	2/14/24	Northwest Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	89.0	19.5	96.4	90+	Pass
303	2/14/24	Northwest Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	84.4	21.0	91.4	90+	Pass
304	2/14/24	Northwest Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.9	15.1	94.1	90+	Pass
305	2/14/24	Northwest Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.8	22.3	93.0	90+	Pass
306	2/14/24	Northwest Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	84.8	18.7	91.9	90+	Pass
307	2/14/24	Northwest Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.4	20.6	93.6	90+	Pass
308	2/19/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	89.1	22.9	96.5	90+	Pass
309	2/19/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.3	26.1	92.4	90+	Pass
310	2/19/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.8	22.5	95.1	90+	Pass
311	2/19/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.8	22.5	95.1	90+	Pass
312	2/19/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.5	17.9	92.6	90+	Pass
313	2/19/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	83.2	18.3	90.1	90+	Pass
314	2/19/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.1	18.9	94.4	90+	Pass
315	2/19/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.0	22.5	93.2	90+	Pass
Soil Field Testing Notes and/or Observations		FG = Finish Grade									

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
316	2/19/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	84.8	23.9	91.9	90+	Pass
317	2/19/24	West Slope See Sketch	FG	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	128.2	9.2	96.8	90+	Pass
318	2/19/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	91.2	15.9	98.8	90+	Pass
319	2/19/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.4	18.7	94.7	90+	Pass
320	2/19/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.3	21.4	93.5	90+	Pass
321	2/19/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	84.5	24.3	91.5	90+	Pass
322	2/19/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	91.0	23.6	98.6	90+	Pass
323	2/19/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	83.9	24.3	90.9	90+	Pass
324	2/19/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	83.9	22.9	90.9	90+	Pass
325	2/19/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	88.1	17.5	95.4	90+	Pass
326	2/19/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.2	17.0	93.4	90+	Pass
327	2/19/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	89.7	22.7	97.2	90+	Pass

Soil Field Testing Notes and/or Observations	FG = Finish Grade

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	January 24, 2024
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Cloudy, cold, 25°-40° °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
(1) Excavator
(2) Bulldozers
(1) Large Single Drum Vibratory Roller

Arriving onsite this morning as scheduled, the undersigned writer met with Mr. Mike Bates, the project superintendent, who requested compaction testing on the west slope.

A review of the work areas found that the crew had previously prepared the abovementioned area for testing.

During this visit, a total of eight (8) nuclear moisture/density readings (tests #328 through #335) were performed. All of the results met the stated 90% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Mr. Bates was made aware of today's field compaction test results prior to my departure. At that time, he stated that our office would be contacted when further testing is required.

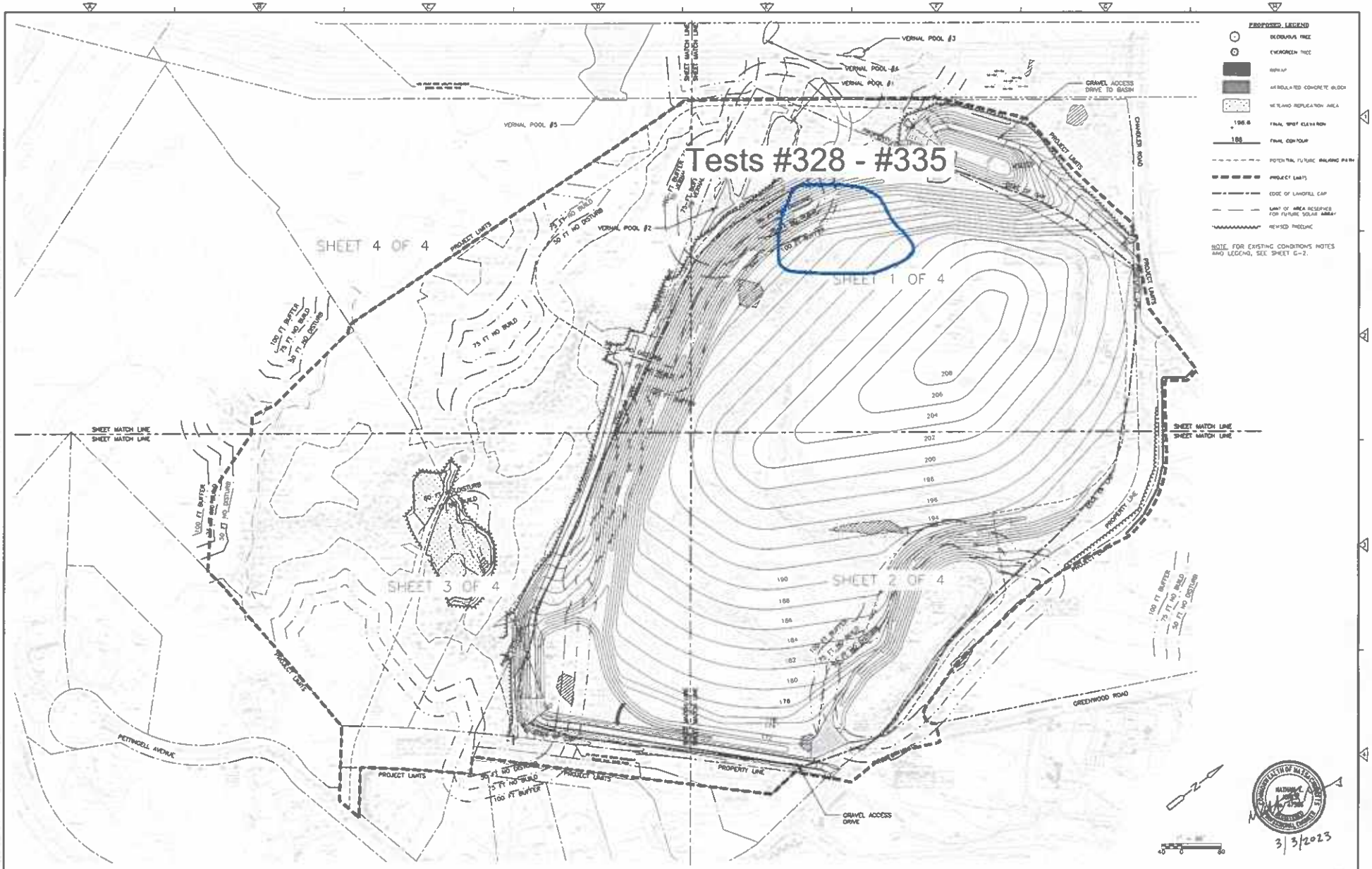
For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Rob Witt

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

26023 Ledge Road Andover SLF

January 24, 2024



3	3/2023	JBH	MCJ	UPDATED FOR BIDDING
2	11/2022	KAR	MCJ	REMOVED POST-CLOSURE USE/ DPW MATERIALS HANDLING AREA
1	6/2022	JBH	MC	REVISED PER REVIEW COMMENTS

DESIGNED BY C. HOWARD
DRAWN BY
SHEET CHKD BY C. CARO
CROSS CHKD BY
APPROVED BY
DATE

CDM Smith

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

OVERALL SITE KEY PLAN

PROJECT NO 0235-3811
FILE NAME C00.3K1PL.DWG
SHEET NO G-3

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
316	2/19/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	84.8	23.9	91.9	90+	Pass
317	2/19/24	West Slope See Sketch	FG	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	128.2	9.2	96.8	90+	Pass
318	2/19/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	91.2	15.9	98.8	90+	Pass
319	2/19/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.4	18.7	94.7	90+	Pass
320	2/19/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.3	21.4	93.5	90+	Pass
321	2/19/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	84.5	24.3	91.5	90+	Pass
322	2/19/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	91.0	23.6	98.6	90+	Pass
323	2/19/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	83.9	24.3	90.9	90+	Pass
324	2/19/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	83.9	22.9	90.9	90+	Pass
325	2/19/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	88.1	17.5	95.4	90+	Pass
326	2/19/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.2	17.0	93.4	90+	Pass
327	2/19/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	89.7	22.7	97.2	90+	Pass
328	1/24/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	89.0	15.6	96.4	90+	Pass
329	1/24/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.9	13.0	94.1	90+	Pass
330	1/24/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	89.9	16.8	97.4	90+	Pass

Soil Field Testing Notes and/or Observations	FG = Finish Grade

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
331	1/24/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.8	18.0	95.1	90+	Pass
332	1/24/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	89.1	20.6	96.5	90+	Pass
333	1/24/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.4	18.0	92.5	90+	Pass
334	1/24/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.6	15.2	93.8	90+	Pass
335	1/24/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.5	22.7	94.8	90+	Pass
336	2/8/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.0	15.6	94.3	90+	Pass
337	2/8/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.0	13.0	93.2	90+	Pass
338	2/8/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.9	16.8	95.2	90+	Pass
339	2/8/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.9	18.0	93.1	90+	Pass
340	2/8/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.8	20.6	93.0	90+	Pass
341	2/8/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.0	18.0	93.2	90+	Pass
342	2/8/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.9	15.2	95.2	90+	Pass
343	2/8/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	88.9	22.7	96.3	90+	Pass
344	2/8/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.9	24.0	93.1	90+	Pass
345	2/8/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.6	22.5	93.8	90+	Pass
Soil Field Testing Notes and/or Observations		FG = Finish Grade									

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
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Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	February 8, 2024
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Sunny, cold, 30°-45° °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
(1) Excavator
(2) Bulldozers
(1) Large Single Drum Vibratory Roller

Arriving onsite this morning as scheduled, the undersigned writer met with Mr. Mike Bates, the project superintendent, who requested compaction testing on the south slope.

A review of the work areas found that the crew had previously prepared the abovementioned area for testing.

During this visit, a total of fourteen (14) nuclear moisture/density readings (tests #336 through #349) were performed. All of the results met the stated 90% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Mr. Bates was informed of today's field compaction test results prior to my departure. At that time, he stated that our office would be contacted when further testing is required.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Rob Witt

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

26023 Ledge Road Andover SLF

February 8, 2024

REV NO	DATE	DRWN	CHKD	REMARKS
3	3/2023	JBH	MCJ	UPDATED FOR BIDDING
2	1/2023	KAR	MCJ	REMOVED POST-CLOSURE USE/ CPH MATERIALS HANDLING AREA
1	1/2023	JBH	MCJ	REVISED TO RESPOND TO CONSERVATION COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY: C. HOWARD
DRAWN BY: J. HCJ
SHEET CHK'D BY: C. CABOT
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: MARCH 2023

CDM Smith
75 Sharp Street Suite 701
Boston MA 02109
Tel (617) 452-6000

TOWN OF ANDOVER MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

OVERALL SITE KEY PLAN

PROJECT NO 0035-113811
FILE NAME: G003KYPL.DWG
SHEET NO G-3

3/3/2023

REUSE OF DOCUMENTS THESE DOCUMENTS AND DESIGNS PROVIDED BY PROFESSIONAL SERVICE INCORPORATED HEREIN ARE THE PROPERTY OF CDM Smith AND ARE NOT TO BE USED IN WHOLE OR PART, FOR ANY OTHER PROJECT without THE WRITTEN AUTHORIZATION OF CDM Smith
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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
331	1/24/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.8	18.0	95.1	90+	Pass
332	1/24/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	89.1	20.6	96.5	90+	Pass
333	1/24/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.4	18.0	92.5	90+	Pass
334	1/24/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.6	15.2	93.8	90+	Pass
335	1/24/24	West Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.5	22.7	94.8	90+	Pass
336	2/8/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.0	15.6	94.3	90+	Pass
337	2/8/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.0	13.0	93.2	90+	Pass
338	2/8/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.9	16.8	95.2	90+	Pass
339	2/8/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.9	18.0	93.1	90+	Pass
340	2/8/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.8	20.6	93.0	90+	Pass
341	2/8/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.0	18.0	93.2	90+	Pass
342	2/8/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.9	15.2	95.2	90+	Pass
343	2/8/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	88.9	22.7	96.3	90+	Pass
344	2/8/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.9	24.0	93.1	90+	Pass
345	2/8/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.6	22.5	93.8	90+	Pass

Soil Field Testing Notes and/or Observations	FG = Finish Grade

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
346	2/8/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.0	21.1	94.3	90+	Pass
347	2/8/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	89.9	21.9	97.4	90+	Pass
348	2/8/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	89.7	22.3	97.2	90+	Pass
349	2/8/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.9	18.8	94.1	90+	Pass
350	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	88.9	21.1	96.3	90+	Pass
351	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.9	23.1	95.2	90+	Pass
352	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.6	21.6	92.7	90+	Pass
353	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	84.6	19.7	91.7	90+	Pass
354	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	88.6	18.6	96.0	90+	Pass
355	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	88.5	22.4	95.9	90+	Pass
356	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	84.5	21.1	91.5	90+	Pass
357	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.3	19.0	94.6	90+	Pass
358	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.2	19.0	92.3	90+	Pass
359	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.7	21.4	93.9	90+	Pass
360	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.4	22.2	94.7	90+	Pass
Soil Field Testing Notes and/or Observations		FG = Finish Grade									

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	February 21, 2024
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Cloudy, cold, 25°-40° °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
(1) Excavator
(2) Bulldozers
(1) Large Single Drum Vibratory Roller

Arriving onsite this morning as scheduled, the undersigned observer met with Mr. Mike Bates, the project superintendent, who requested compaction testing on the west slope.

A review of the work areas found that; prior to my arrival, the crew had prepared the abovementioned area for testing.

During this visit, a total of sixteen (16) nuclear moisture/density readings (tests #350 through #365) were performed. All of the results met the stated 90% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Mr. Bates was informed of today's field compaction test results prior to my departure.

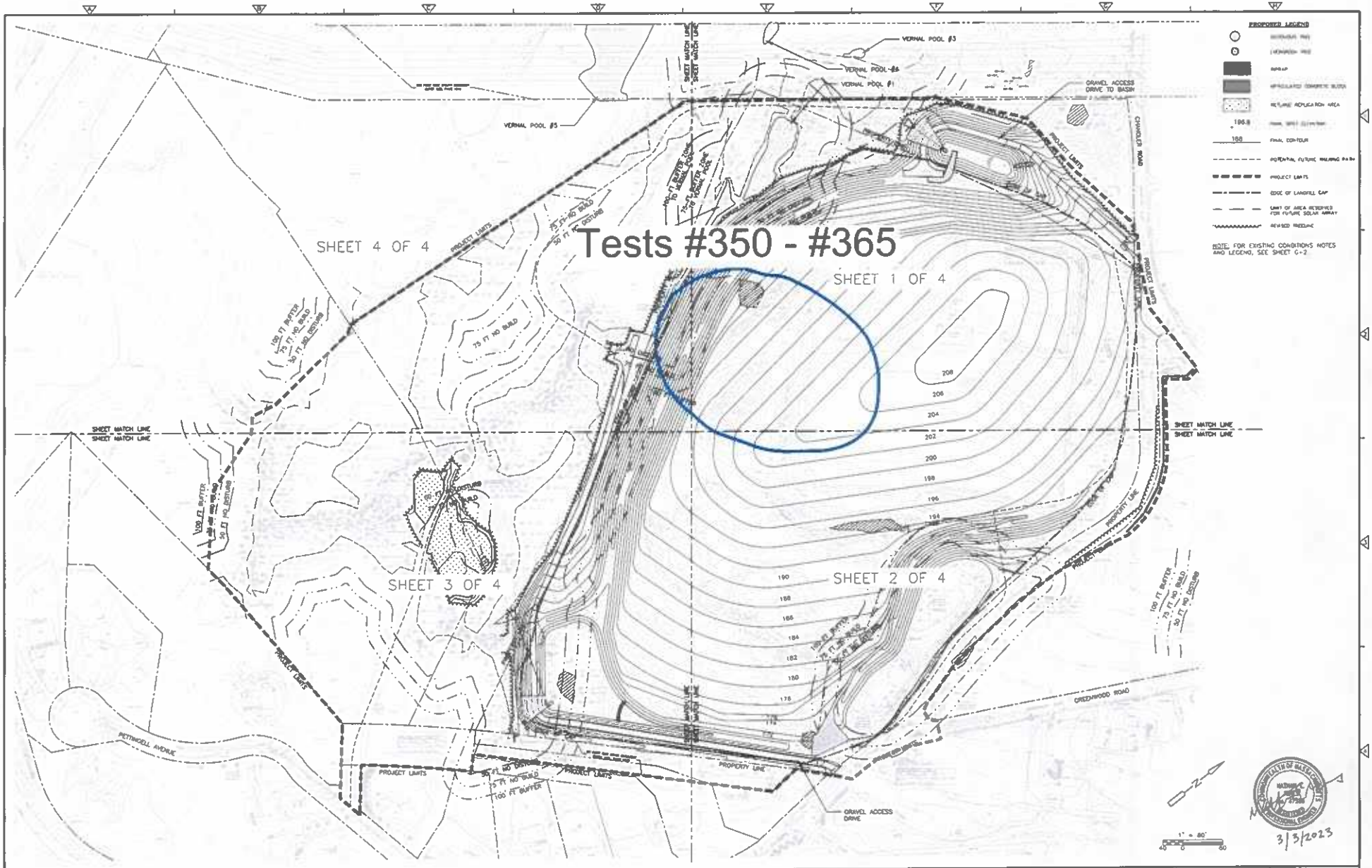
For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Rob Witt

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

26023 Andover SLF

02/21/24



REV NO.	DATE	DRWN	CHKD	REMARKS
3	3/2023	JBH	MCJ	UPDATED FOR BIDDING
2	11/2022	NAR	MCJ	REMOVED POST-CLOSURE USE/ DPW MATERIALS HANDLING AREA
1	4/2022	JBH	MCJ	REVISED RESPOND TO CONSERVATION COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY C. HOWARD
DRAWN BY J. HOL
SHEET CHK'D BY C. CARO
CROSS CHK'D BY N. JONES
APPROVED BY N. JONES
DATE MARCH 2023

CDM Smith
75 State Street, Suite 701
Boston, MA 02109
Tel 617-452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

OVERALL SITE KEY PLAN

PROJECT NO. 0235-113811
FILE NAME: C00SKYPL.DWG
SHEET NO G-3

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
346	2/8/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.0	21.1	94.3	90+	Pass
347	2/8/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	89.9	21.9	97.4	90+	Pass
348	2/8/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	89.7	22.3	97.2	90+	Pass
349	2/8/24	South Slope See Sketch	FG	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.9	18.8	94.1	90+	Pass
350	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	88.9	21.1	96.3	90+	Pass
351	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.9	23.1	95.2	90+	Pass
352	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.6	21.6	92.7	90+	Pass
353	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	84.6	19.7	91.7	90+	Pass
354	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	88.6	18.6	96.0	90+	Pass
355	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	88.5	22.4	95.9	90+	Pass
356	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	84.5	21.1	91.5	90+	Pass
357	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.3	19.0	94.6	90+	Pass
358	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.2	19.0	92.3	90+	Pass
359	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.7	21.4	93.9	90+	Pass
360	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.4	22.2	94.7	90+	Pass
Soil Field Testing Notes and/or Observations		FG = Finish Grade									

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
361	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	88.1	23.6	95.4	90+	Pass
362	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.2	19.9	92.3	90+	Pass
363	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.4	19.3	93.6	90+	Pass
364	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.0	21.0	94.3	90+	Pass
365	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.0	22.1	94.3	90+	Pass
366	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.5	21.1	93.7	90+	Pass
367	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.7	23.1	93.9	90+	Pass
368	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.4	21.6	93.6	90+	Pass
369	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	88.3	19.7	95.7	90+	Pass
370	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.6	18.6	92.7	90+	Pass
371	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.1	22.4	94.4	90+	Pass
372	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	88.9	21.1	96.3	90+	Pass
373	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.4	19.0	92.5	90+	Pass
374	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.3	19.0	93.5	90+	Pass
375	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.0	21.4	94.3	90+	Pass
Soil Field Testing Notes and/or Observations		FG = Finish Grade									

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	February 26, 2024
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Cloudy, cool, 30°-50° °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
(1) Excavator
(2) Bulldozers
(1) Large Single Drum Vibratory Roller

Arriving onsite this morning as scheduled, the undersigned writer met with Mr. Mike Bates, the project superintendent, who requested compaction testing on the southwest slope.

A review of the work areas found that; prior to my arrival, the crew had prepared the abovementioned area for testing.

During this visit, a total of sixteen (16) nuclear moisture/density readings (tests #366 through #381) were performed. All of the results met the stated 90% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Mr. Bates was made aware of today's field compaction test results prior to my departure.

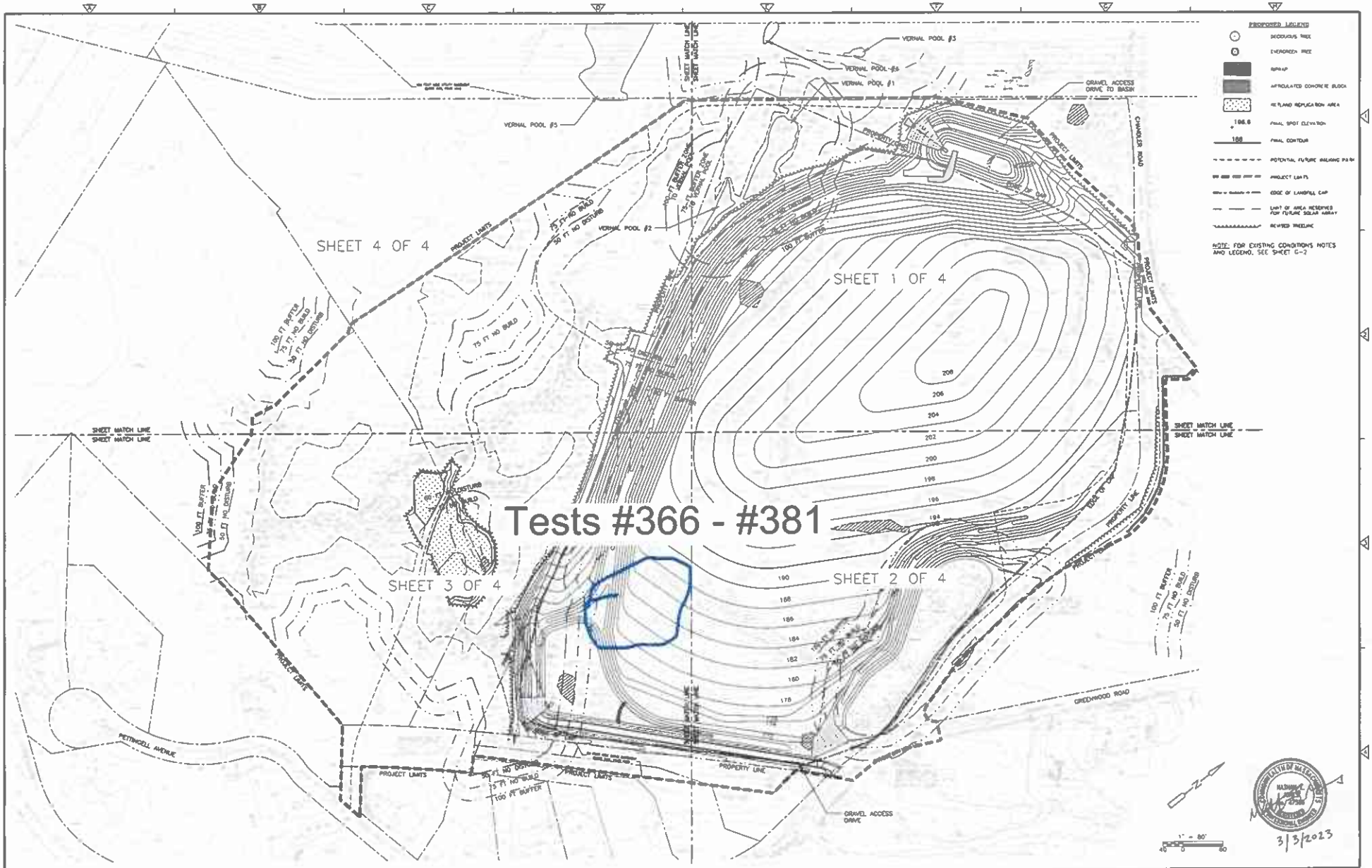
For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Rob Witt

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

26023 Andover SLF

02/26/24



REV NO.	DATE	DRWN	CHKD	REMARKS
3	1/2023	JBH	MCJ	UPDATED FOR BIDDING
2	1/2023	KAR	MCJ	REMOVED POST-CLOSURE USE/ DPW MATERIALS HANDLING AREA
1	1/2023	JBH	MCJ	REVISED TO RESPOND TO CONSERVATION COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY: C. HOWARD
DRAWN BY: J. MCL
SHEET CHK'D BY: C. GARDI
CROSS CHK'D BY: N. JONES
APPROVED BY: N. JONES
DATE: MARCH 2023

CDM Smith
75 State Street Suite 701
Boston, MA 02109
Tel (617) 452-6000

TOWN OF ANDOVER MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

OVERALL SITE KEY PLAN

PROJECT NO 0035-113811
FILE NAME G003KYPLDWG
SHEET NO G-3

Data: Andover Survey Dtm - WSP 2215_Final_Grading_Aerial_CDM5_3156 Full Site Survey Revised 5 1 16, CDM(GRAL, 16365-C5-BM) snapped to
Last saved by: MCLAM Time: 1/26/2023 10:25:51 AM
File: C:\Users\mclam\Desktop\Andover\0035113811\04 Design Services and CDM\G003KYPL.dwg
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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	**JBS//Andover Ledge Road SLF**	**Project No#**	**26023**
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
361	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	88.1	23.6	95.4	90+	Pass
362	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.2	19.9	92.3	90+	Pass
363	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.4	19.3	93.6	90+	Pass
364	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.0	21.0	94.3	90+	Pass
365	2/21/24	West Slope See Sketch	191.4'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.0	22.1	94.3	90+	Pass
366	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.5	21.1	93.7	90+	Pass
367	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.7	23.1	93.9	90+	Pass
368	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.4	21.6	93.6	90+	Pass
369	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	88.3	19.7	95.7	90+	Pass
370	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.6	18.6	92.7	90+	Pass
371	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.1	22.4	94.4	90+	Pass
372	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	88.9	21.1	96.3	90+	Pass
373	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.4	19.0	92.5	90+	Pass
374	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.3	19.0	93.5	90+	Pass
375	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.0	21.4	94.3	90+	Pass
Soil Field Testing Notes and/or Observations		FG = Finish Grade									

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	**JBS//Andover Ledge Road SLF**	**Project No#**	**26023**
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
376	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.1	22.2	92.2	90+	Pass
377	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.7	23.6	95.0	90+	Pass
378	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	84.9	19.9	92.0	90+	Pass
379	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.7	19.3	93.9	90+	Pass
380	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.3	21.0	93.5	90+	Pass
381	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.7	22.1	92.8	90+	Pass

Soil Field Testing Notes and/or Observations

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	March 21, 2024
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Partly cloudy, windy, 20º's-30º's °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
(1) Excavator
(2) Bulldozers
(1) Large Single Drum Vibratory Roller

Arriving onsite this morning as scheduled, the undersigned observer met with Mr. Eric Richardson, the project foreman, who requested compaction testing on the north slope.

A review of the work areas found that; prior to my arrival, the crew had prepared the abovementioned area for testing.

During this visit, a total of fourteen (14) nuclear moisture/density readings (tests #382 through #395) were performed. All of the results met the stated 90% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Mr. Richardson was informed of today's field compaction test results prior to my departure.

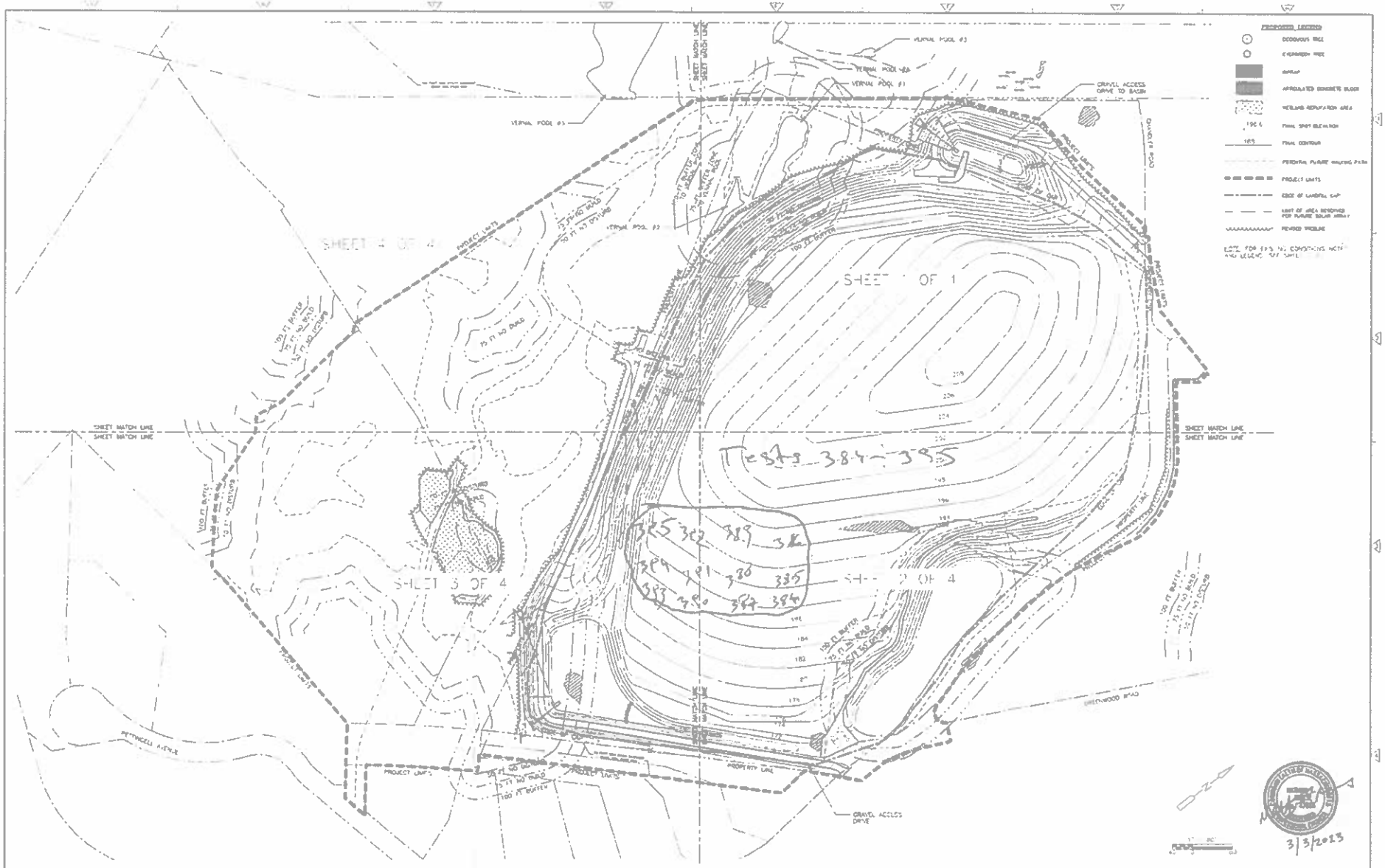
For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Artur Hoxha

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

03/21/24 26023 Andover SLF

A.H.



CDM Smith

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

OVERALL SITE KEY PLAN

G-3

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
376	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.1	22.2	92.2	90+	Pass
377	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	87.7	23.6	95.0	90+	Pass
378	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	84.9	19.9	92.0	90+	Pass
379	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.7	19.3	93.9	90+	Pass
380	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	86.3	21.0	93.5	90+	Pass
381	2/26/24	Southwest Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	85.7	22.1	92.8	90+	Pass
382	3/21/24	North Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	89.6	10.2	97.1	90+	Pass
383	3/21/24	North Slope See Sketch	199.75'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	90.4	11.8	97.9	90+	Pass
384	3/21/24	North Slope See Sketch	192'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	91.6	12.5	99.2	90+	Pass
385	3/21/24	North Slope See Sketch	195'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	91.4	11.6	99.0	90+	Pass
386	3/21/24	North Slope See Sketch	197'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	91.8	10.5	99.5	90+	Pass
387	3/21/24	North Slope See Sketch	193'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	90.6	12.9	98.2	90+	Pass
388	3/21/24	North Slope See Sketch	196'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	89.4	13.2	96.9	90+	Pass
389	3/21/24	North Slope See Sketch	199'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	88.4	12.8	95.8	90+	Pass
390	3/21/24	North Slope See Sketch	193'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	90.5	10.3	98.0	90+	Pass
Soil Field Testing Notes and/or Observations											

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
391	3/21/24	North Slope See Sketch	195'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	91.2	13.5	98.8	90+	Pass
392	3/21/24	North Slope See Sketch	198'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	92.3	12.9	100.0	90+	Pass
393	3/21/24	North Slope See Sketch	194'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	90.5	12.6	98.0	90+	Pass
394	3/21/24	North Slope See Sketch	196'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	90.7	11.4	98.3	90+	Pass
395	3/21/24	North Slope See Sketch	199'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	89.4	13.2	96.9	90+	Pass

Soil Field Testing Notes and/or Observations

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	June 17, 2024
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Sunny, warm, 55°-85° °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
(1) Excavator
(2) Bulldozers
(1) Large Single Drum Vibratory Roller

Arriving onsite this morning as scheduled, the undersigned technician met with Mr. Mike Bates, the project superintendent, who requested compaction testing on the north berm of the north pond.

During this visit, a total of four (4) nuclear moisture/density readings (tests #396 through #399) were performed. All of the results met the stated 90% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Mr. Bates was notified of today's field compaction test results prior to my departure. At that time, he indicated that our office would be contacted when further testing is required.

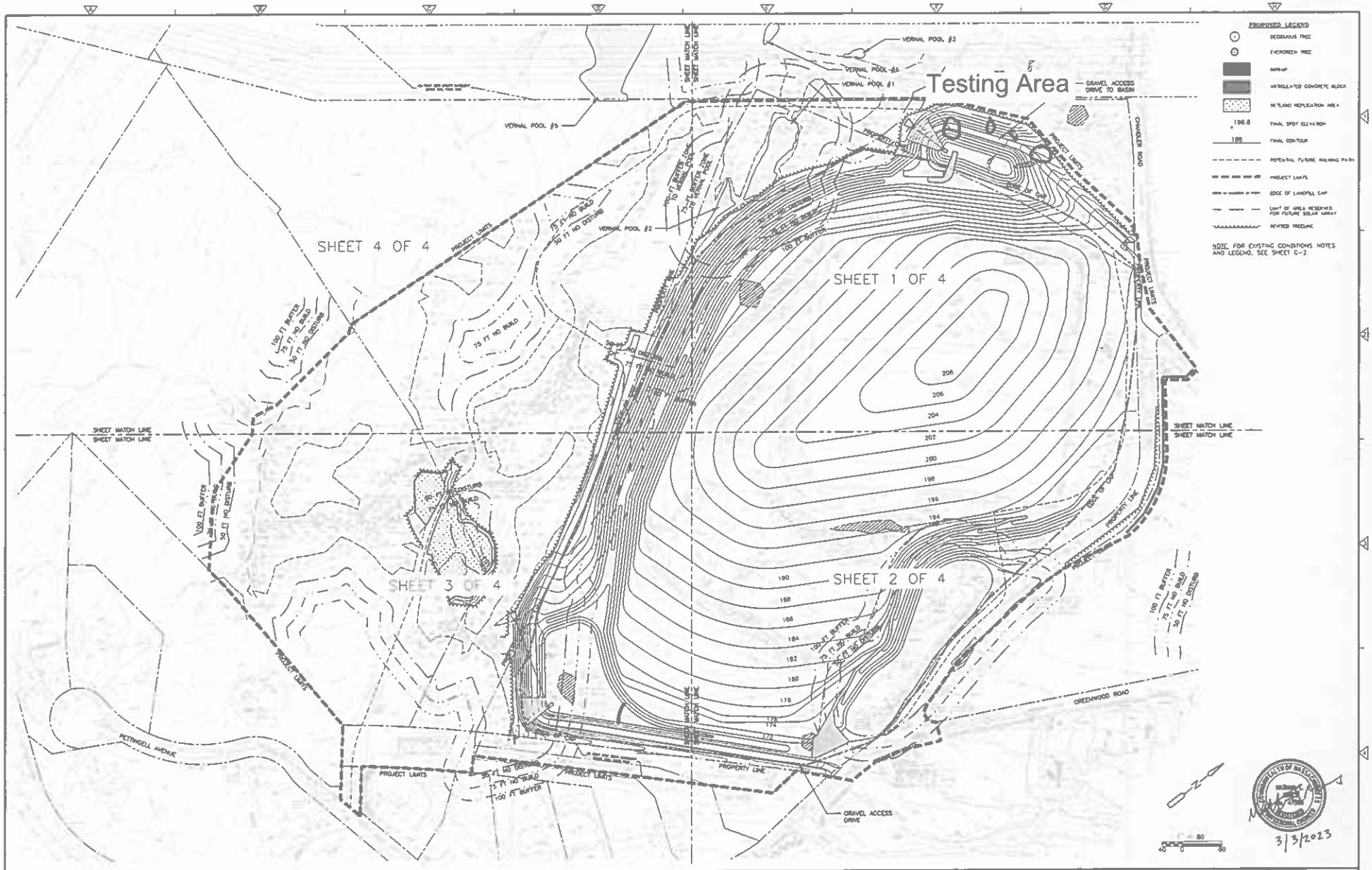
For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Anthony Courteau

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

26023 Andover Ledge Road Landfill Closure

06/17/2024



REV NO.	DATE	DRAWN	CHKD	REMARKS
3	3/2023	JBH	MCJ	UPDATE FOR BIDDING
2	11/2022	MAR	MCJ	REMOVED POST-CLOSURE USE / DPW MATERIALS HANDLING AREA
1	4/2022		MCJ	REVISIONS - RESPONSE TO CONSERVATION COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY C. HOWARD
DRAWN BY J. MCS
SHEET CHK'D BY C. CASEY
CROSS CHK'D BY N. JONES
APPROVED BY N. JONES
DATE MARCH 2023

CDM Smith
75 State Street, Suite 701
Boston, MA 02109
Tel 617-452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

OVERALL SITE KEY PLAN

PROJECT NO 0235-1130
FILE NAME G003KYPL.DWG
SHEET NO G-3

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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
391	3/21/24	North Slope See Sketch	195'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	91.2	13.5	98.8	90+	Pass
392	3/21/24	North Slope See Sketch	198'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	92.3	12.9	100.0	90+	Pass
393	3/21/24	North Slope See Sketch	194'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	90.5	12.6	98.0	90+	Pass
394	3/21/24	North Slope See Sketch	196'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	90.7	11.4	98.3	90+	Pass
395	3/21/24	North Slope See Sketch	199'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	89.4	13.2	96.9	90+	Pass
396	6/17/24	North Berm East	184.5'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	127.0	6.5	95.0	90+	Pass
397	6/17/24	North Berm Centrer	176'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	124.5	7.5	93.1	90+	Pass
398	6/17/24	North Berm West	175.2'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	127.9	5.7	95.7	90+	Pass
399	6/17/24	North Berm Northeast	188.4'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	122.0	9.6	91.2	90+	Pass

Soil Field Testing Notes and/or Observations	

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	June 11, 2024
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Sunny, 70°'s °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:

(1) Bulldozer
(1) Rock Truck
(1) Single Drum Vibratory Roller
(2) Large Excavators

Arriving onsite this morning as scheduled, the undersigned writer met with Mr. Mike Bates, the project superintendent, who requested monitoring and density testing on the ongoing earthwork operations.

Throughout this visit, the crew placed and compacted multiple lifts of brown 4" max silty sand/gravel material in the north pond berm area.

During this visit, a total of six (6) nuclear moisture/density readings (tests #400 through #405) were performed. All of the results met the stated 90% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Mr. Bates was informed of today's field compaction test results prior to my departure.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet.

Report By: Ryan McConville

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

REV NO.	DATE	DRWN	CHKD	REMARKS
3	3/2023	JBH	MEJ	UPDATED FOR MEDIMS
2	1/2023	JBH	MEJ	REVISED POST-CLOSURE USE/ SPW MATERIALS HANDLING AREA
1	4/2021	JBH	MEJ	REVISED TO RESPOND TO CONSERVATION COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY: G. HOWARD
DRAWN BY: J. [illegible]
SHEET CHK'D BY: G. FARELL
CROSS CHK'D BY: M. JONES
APPROVED BY: M. JONES
DATE: MARCH 2023

CDM Smith

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

OVERALL SITE KEY PLAN

G-3

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
391	3/21/24	North Slope See Sketch	195'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	91.2	13.5	98.8	90+	Pass
392	3/21/24	North Slope See Sketch	198'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	92.3	12.9	100.0	90+	Pass
393	3/21/24	North Slope See Sketch	194'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	90.5	12.6	98.0	90+	Pass
394	3/21/24	North Slope See Sketch	196'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	90.7	11.4	98.3	90+	Pass
395	3/21/24	North Slope See Sketch	199'	Black 2" max silty sand/organics ome gravel (manure smell) (L-3382	92.3	21.0	89.4	13.2	96.9	90+	Pass
396	6/17/24	North Berm East	184.5'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	127.0	6.5	95.0	90+	Pass
397	6/17/24	North Berm Centrer	176'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	124.5	7.5	93.1	90+	Pass
398	6/17/24	North Berm West	175.2'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	127.9	5.7	95.7	90+	Pass
399	6/17/24	North Berm Northeast	188.4'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	122.0	9.6	91.2	90+	Pass
400	6/11/24	North Pond Berm	171.0'	Brown 4" max silty sand some grave (L-34499)	129.5	7.1	129.2	5.8	99.8	90+	Pass
401	6/11/24	North Pond Berm	171.0'	Brown 4" max silty sand some grave (L-34499)	129.5	7.1	129.0	5.6	99.6	90+	Pass
402	6/11/24	North Pond Berm	173.0'	Brown 4" max silty sand some grave (L-34499)	129.5	7.1	130.0	7.0	100.4	90+	Pass
403	6/11/24	North Pond Berm	173.0'	Brown 4" max silty sand some grave (L-34499)	129.5	7.1	127.8	6.8	98.7	90+	Pass
404	6/11/24	North Pond Berm	175.0'	Brown 4" max silty sand some grave (L-34499)	129.5	7.1	125.7	6.2	97.1	90+	Pass
405	6/11/24	North Pond Berm	175.0'	Brown 4" max silty sand some grave (L-34499)	129.5	7.1	126.4	6.9	97.6	90+	Pass

Soil Field Testing Notes and/or Observations	

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	August 16, 2024
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Sunny, 60°-80° °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
(1) Large Bulldozer (1) Large Riding Vibratory Roller

Arriving onsite this morning as scheduled, the undersigned observer met with Mr. Eric Richardson, the project superintendent, who requested compaction testing on the access road at the southwest corner of the project.

A review of the work area found that, prior to my arrival, the crew had placed and compacted, with a large riding roller, a lift of brown 3" max silty sand/gravel in the abovementioned area.

During this visit, a total of six (6) nuclear moisture/density readings (tests #434 through #439) were performed. All of the results met the stated 95% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Mr. Richardson was made aware of today's field compaction test results prior to my departure.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Rez Sbat

10 Mason Street, Worcester, MA 01609
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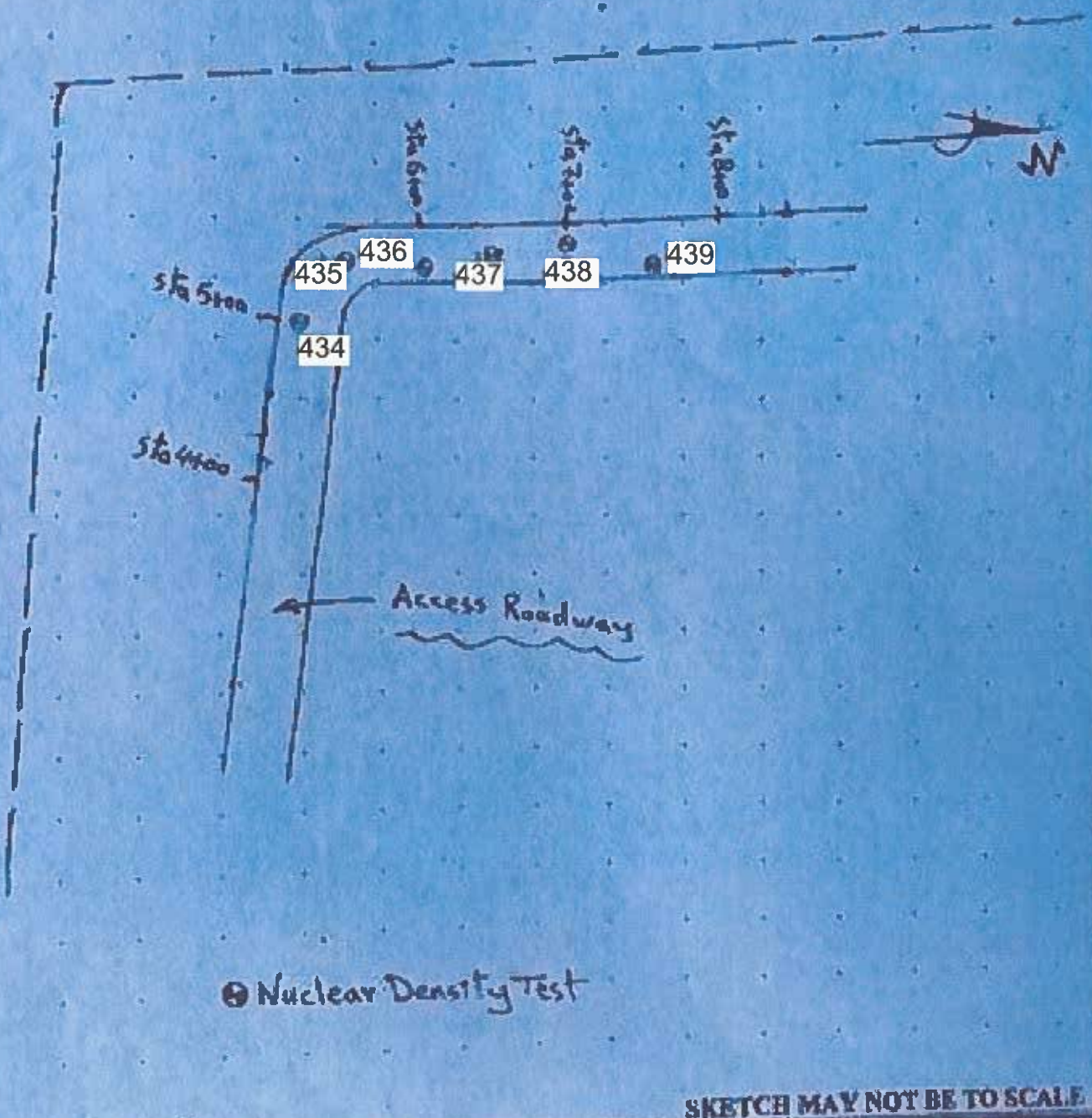
Yankee Engineering & Testing, Inc.

Project Field Sketch

Project: Ledge RASLF
Location: Andover, MA
Date: 8-16-24
Job No#: 24023



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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
421	7/11/24	Road Base Station 1+50	168.5'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	133.5	8.1	99.9	95+	Pass
422	7/11/24	Road Base Station 1+50	169.5'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	130.7	6.5	97.8	95+	Pass
423	7/11/24	Road Base Station 0+50	169.5'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	127.0	8.0	95.0	95+	Pass
424	7/11/24	Road Base Station 4+50	168'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	131.1	8.4	98.1	95+	Pass
425	7/11/24	Road Base Station 5+00	168'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	128.8	7.4	96.3	95+	Pass
426	7/16/24	Access Road Station 3+50	169.8'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	135.2	5.9	99.3	90+	Pass
427	7/16/24	Access Road Station 4+00	169'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	131.6	7.2	96.7	95+	Pass
428	7/16/24	Access Road Station 4+50	169'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	129.9	7.5	95.4	95+	Pass
429	7/16/24	Access Road Station 5+00	167.5'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	137.2	4.2	100.8	95+	Pass
430	7/16/24	Access Road Station 5+50	166'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	130.6	7.4	96.0	95+	Pass
431	7/16/24	Access Road Station 6+00	166'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	132.3	7.3	97.2	95+	Pass
432	7/16/24	Access Road Station 6+50	166'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	129.4	8.1	95.1	95+	Pass
433	7/16/24	Access Road Station 7+00	166'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	130.0	7.8	95.5	95+	Pass
434	8/16/24	Access Road Station 5+00 Left	170.6'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	133.0	9.1	97.7	95+	Pass
435	8/16/24	Access Road Station 5+50 Center	170.1'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	133.6	8.6	98.2	95+	Pass
Soil Field Testing Notes and/or Observations											

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	**JBS//Andover Ledge Road SLF**	**Project No#**	**26023**
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
436	8/16/24	Access Road Station 6+00 Right	168.6'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	132.0	9.2	97.0	95+	Pass
437	8/16/24	Access Road Station 6+50 Center	168.7'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	129.4	10.7	95.1	95+	Pass
438	8/16/24	Access Road Station 7+00 Left	166.7'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	131.1	9.3	96.3	95+	Pass
439	8/16/24	Access Road Station 7+50 Right	164.5'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	129.5	9.5	95.2	95+	Pass

Soil Field Testing Notes and/or Observations

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	August 21, 2024
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Overcast/rain, 70°s °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
NONE

Arriving onsite this afternoon as scheduled, the undersigned observer met with Jeff, the site representative, who requested monitoring and density testing on the ongoing earthwork operations.

A review of the work area found that, prior to my arrival, the crew had placed and compacted, with what appeared to be 5 to 6 passes of a 10 ton vibratory roller, a 1'± lift of the dark brown silty sand/gravel material in the access road area, from stations 7+00 to 8+50, to various elevations, and in the western third of the southwest basin, to elevation 165'±.

During this visit, a total of seven (7) nuclear moisture/density readings (tests #440 through #446) were performed. All of the results met the stated 90% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Jeff was made aware of today's field compaction test results prior to my departure. At that time, he scheduled a return visit for tomorrow afternoon (08/22/24).

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet.

Report By: Art Swanson

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
436	8/16/24	Access Road Station 6+00 Right	168.6'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	132.0	9.2	97.0	95+	Pass
437	8/16/24	Access Road Station 6+50 Center	168.7'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	129.4	10.7	95.1	95+	Pass
438	8/16/24	Access Road Station 7+00 Left	166.7'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	131.1	9.3	96.3	95+	Pass
439	8/16/24	Access Road Station 7+50 Right	164.5'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	129.5	9.5	95.2	95+	Pass
440	8/21/24	Access Road Station 7+00	168.5'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	127.1	10.4	95.1	90+	Pass
441	8/21/24	Access Road Station 7+50	169.5'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	124.3	10.2	93.0	90+	Pass
442	8/21/24	Access Road Station 8+00	170.5'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	127.5	9.0	95.4	90+	Pass
443	8/21/24	Access Road Station 8+50	170.0'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	125.9	10.0	94.2	90+	Pass
444	8/21/24	Southwest Basin Western Third - North	165'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	125.3	9.6	93.7	90+	Pass
445	8/21/24	Southwest Basin Western Third - Middle	165'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	122.8	9.0	91.8	90+	Pass
446	8/21/24	Southwest Basin Western Third - South	165'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	126.0	9.6	94.2	90+	Pass
447	8/22/24	Southwest Basin Eastern Third	165'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	126.0	8.9	94.2	90+	Pass
448	8/22/24	Southwest Basin Eastern Third	165'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	121.3	9.0	90.7	90+	Pass
449	8/22/24	Southwest Basin Eastern Third	165'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	123.9	9.0	92.7	90+	Pass
450	8/22/24	Southwest Basin Eastern Third	165'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	124.9	8.7	93.4	90+	Pass
Soil Field Testing Notes and/or Observations											

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	August 22, 2024
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Mostly sunny, warm, 70°-80° °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
NONE

Arriving onsite this afternoon as scheduled, the undersigned observer met with Eric, the site representative, who requested monitoring and density testing on the ongoing earthwork operations.

A review of the work area found that, prior to my arrival, the crew had placed and compacted, with what appeared to be several passes of a 10 ton vibratory roller, a 1'± lift of the dark brown silty sand/gravel material in the eastern third of the southwest basin, to elevation 165'±, and along the north berm, to elevation 167'.

During this visit, a total of seven (7) nuclear moisture/density readings (tests #447 through #453) were performed. All of the results met the stated 90% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Jeff was made aware of today's field compaction test results prior to my departure. At that time, he stated that our office would be contacted when a return visit is required.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet.

Report By: Art Swanson

10 Mason Street, Worcester, MA 01609
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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
436	8/16/24	Access Road Station 6+00 Right	168.6'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	132.0	9.2	97.0	95+	Pass
437	8/16/24	Access Road Station 6+50 Center	168.7'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	129.4	10.7	95.1	95+	Pass
438	8/16/24	Access Road Station 7+00 Left	166.7'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	131.1	9.3	96.3	95+	Pass
439	8/16/24	Access Road Station 7+50 Right	164.5'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	129.5	9.5	95.2	95+	Pass
440	8/21/24	Access Road Station 7+00	168.5'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	127.1	10.4	95.1	90+	Pass
441	8/21/24	Access Road Station 7+50	169.5'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	124.3	10.2	93.0	90+	Pass
442	8/21/24	Access Road Station 8+00	170.5'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	127.5	9.0	95.4	90+	Pass
443	8/21/24	Access Road Station 8+50	170.0'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	125.9	10.0	94.2	90+	Pass
444	8/21/24	Southwest Basin Western Third - North	165'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	125.3	9.6	93.7	90+	Pass
445	8/21/24	Southwest Basin Western Third - Middle	165'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	122.8	9.0	91.8	90+	Pass
446	8/21/24	Southwest Basin Western Third - South	165'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	126.0	9.6	94.2	90+	Pass
447	8/22/24	Southwest Basin Eastern Third	165'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	126.0	8.9	94.2	90+	Pass
448	8/22/24	Southwest Basin Eastern Third	165'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	121.3	9.0	90.7	90+	Pass
449	8/22/24	Southwest Basin Eastern Third	165'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	123.9	9.0	92.7	90+	Pass
450	8/22/24	Southwest Basin Eastern Third	165'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	124.9	8.7	93.4	90+	Pass
Soil Field Testing Notes and/or Observations											

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	**JBS//Andover Ledge Road SLF**	**Project No#**	**26023**
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
451	8/22/24	Southwest Basin Eastern Third	165'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	126.5	8.9	94.6	90+	Pass
452	8/22/24	Southwest Basin Eastern Third	165'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	125.1	9.6	93.6	90+	Pass
453	8/22/24	North Berm	167'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	127.8	8.3	95.6	90+	Pass

Soil Field Testing Notes and/or Observations	

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	August 16, 2024
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Sunny, 60°-80° °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
(1) Large Bulldozer (1) Large Riding Vibratory Roller

Arriving onsite this morning as scheduled, the undersigned observer met with Mr. Eric Richardson, the project superintendent, who requested compaction testing on the access road at the southwest corner of the project.

A review of the work area found that, prior to my arrival, the crew had placed and compacted, with a large riding roller, a lift of brown 3" max silty sand/gravel in the abovementioned area.

During this visit, a total of six (6) nuclear moisture/density readings (tests #434 through #439) were performed. All of the results met the stated 95% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Mr. Richardson was made aware of today's field compaction test results prior to my departure.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Rez Sbat

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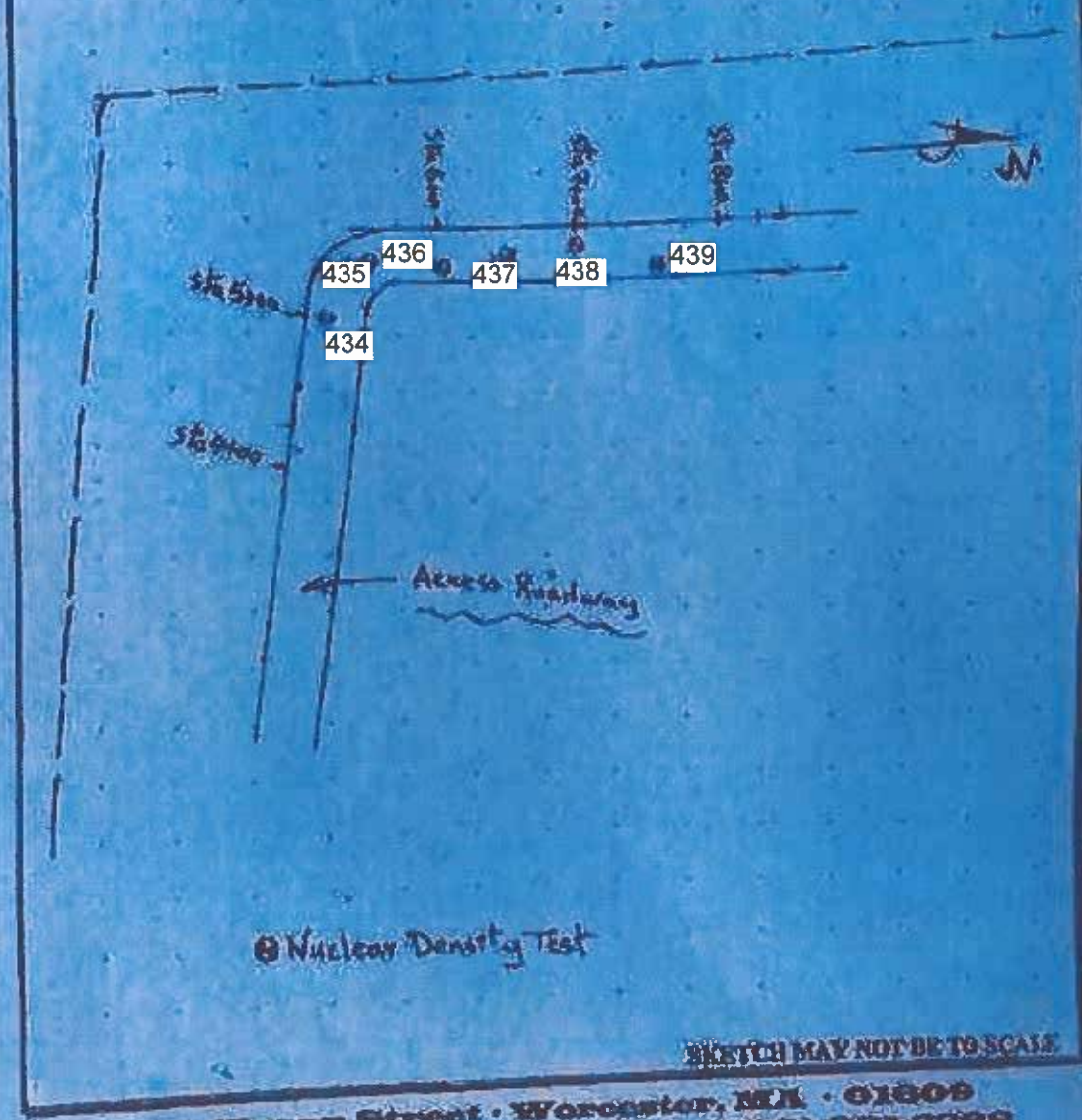
Yankee Engineering & Testing, Inc.

Project Field Sketch

Project: Ledge BASF **Date:** [illegible]

Location: Andover, MA **Job No#:** [illegible]



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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
421	7/11/24	Road Base Station 1+50	168.5'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	133.5	8.1	99.9	95+	Pass
422	7/11/24	Road Base Station 1+50	169.5'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	130.7	6.5	97.8	95+	Pass
423	7/11/24	Road Base Station 0+50	169.5'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	127.0	8.0	95.0	95+	Pass
424	7/11/24	Road Base Station 4+50	168'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	131.1	8.4	98.1	95+	Pass
425	7/11/24	Road Base Station 5+00	168'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	128.8	7.4	96.3	95+	Pass
426	7/16/24	Access Road Station 3+50	169.8'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	135.2	5.9	99.3	90+	Pass
427	7/16/24	Access Road Station 4+00	169'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	131.6	7.2	96.7	95+	Pass
428	7/16/24	Access Road Station 4+50	169'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	129.9	7.5	95.4	95+	Pass
429	7/16/24	Access Road Station 5+00	167.5'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	137.2	4.2	100.8	95+	Pass
430	7/16/24	Access Road Station 5+50	166'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	130.6	7.4	96.0	95+	Pass
431	7/16/24	Access Road Station 6+00	166'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	132.3	7.3	97.2	95+	Pass
432	7/16/24	Access Road Station 6+50	166'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	129.4	8.1	95.1	95+	Pass
433	7/16/24	Access Road Station 7+00	166'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	130.0	7.8	95.5	95+	Pass
434	8/16/24	Access Road Station 5+00 Left	170.6'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	133.0	9.1	97.7	95+	Pass
435	8/16/24	Access Road Station 5+50 Center	170.1'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	133.6	8.6	98.2	95+	Pass
Soil Field Testing Notes and/or Observations											

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	**JBS//Andover Ledge Road SLF**	**Project No#**	**26023**
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
436	8/16/24	Access Road Station 6+00 Right	168.6'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	132.0	9.2	97.0	95+	Pass
437	8/16/24	Access Road Station 6+50 Center	168.7'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	129.4	10.7	95.1	95+	Pass
438	8/16/24	Access Road Station 7+00 Left	166.7'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	131.1	9.3	96.3	95+	Pass
439	8/16/24	Access Road Station 7+50 Right	164.5'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	129.5	9.5	95.2	95+	Pass

Soil Field Testing Notes and/or Observations	

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	August 13, 2024
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Partly sunny, foggy, humid, 80°s °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
(1) Large Single Drum Roller

Arriving onsite this afternoon as scheduled, the undersigned observer met with Mr. Bates and Mr. Andrew Carr, who stated that the crew was scheduled to re-compact the berm area. Compaction testing was requested every 50'.

A review of the work area found the crew in the process of compacting the previously prepared berm area.

During this visit, a total of fourteen (14) nuclear moisture/density readings (tests #454 through #467) were performed. All of the results met the stated 90% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Mr. Carr was made aware of today's field compaction test results prior to my departure.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Eric Moody

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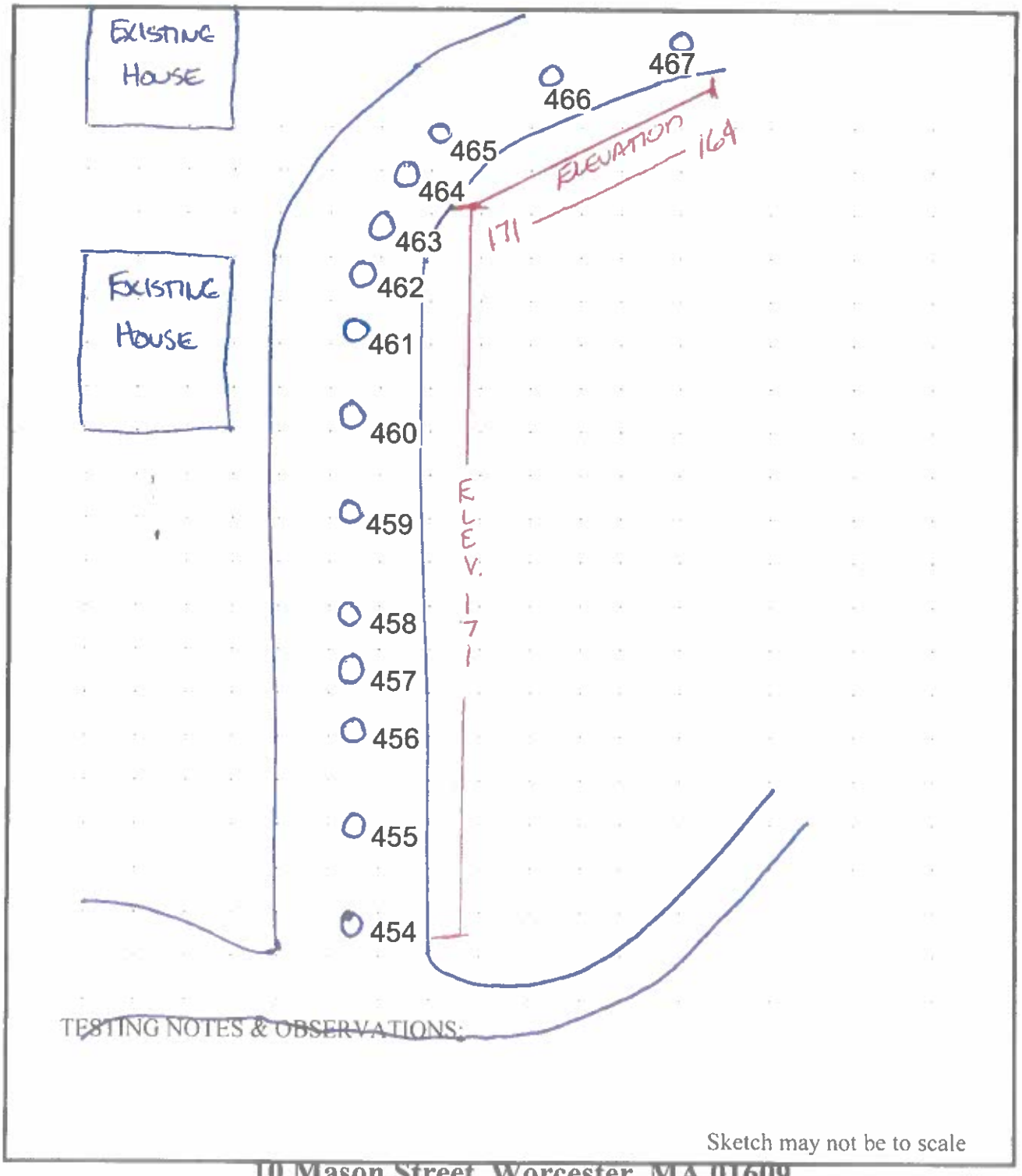
Yankee Engineering and Testing, Inc.

Project Site Field Sketch

Project Name:	JBS//Andover Ledge Road SLF	**Date:**	8-13-24
Project Address:	Ledge Road, Andover MA	**Project No.**	26023



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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
451	8/22/24	Southwest Basin Eastern Third	165'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	126.5	8.9	94.6	90+	Pass
452	8/22/24	Southwest Basin Eastern Third	165'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	125.1	9.6	93.6	90+	Pass
453	8/22/24	North Berm	167'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	127.8	8.3	95.6	90+	Pass
454	8/13/24	Berm Area see sketch	171'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	125.3	7.5	94.6	90+	Pass
455	8/13/24	Berm Area see sketch	164'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	125.3	6.5	94.6	90+	Pass
456	8/13/24	Berm Area see sketch	164'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	128.2	6.8	96.8	90+	Pass
457	8/13/24	Berm Area see sketch	164'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	122.9	7.2	92.8	90+	Pass
458	8/13/24	Berm Area see sketch	164'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	124.6	7.1	94.0	90+	Pass
459	8/13/24	Berm Area see sketch	164'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	126.5	7.2	95.5	90+	Pass
460	8/13/24	Berm Area see sketch	164'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	129.4	8.1	97.7	90+	Pass
461	8/13/24	Berm Area see sketch	164'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	129.0	8.2	97.4	90+	Pass
462	8/13/24	Berm Area see sketch	164'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	131.4	8.0	99.2	90+	Pass
463	8/13/24	Berm Area see sketch	164'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	128.4	8.0	96.9	90+	Pass
464	8/13/24	Berm Area see sketch	164'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	129.1	8.5	97.4	90+	Pass
465	8/13/24	Berm Area see sketch	164'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	128.3	8.1	96.8	90+	Pass
Soil Field Testing Notes and/or Observations											

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
466	8/13/24	Berm Area see sketch	164'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	129.3	8.5	97.6	90+	Pass
467	8/13/24	Berm Area see sketch	164'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	130.8	8.8	98.7	90+	Pass
468	8/29/24	North Berm South	169.8'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	132.2	7.9	98.9	90+	Pass
469	8/29/24	North Berm South Central	170'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	131.0	6.2	98.0	90+	Pass
470	8/29/24	North Berm North Central	171.2'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	129.2	5.8	96.6	90+	Pass
471	8/29/24	North Berm North	171.5'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	129.4	7.0	96.8	90+	Pass
472	8/29/24	North Berm West Toe	166.2'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	129.0	6.1	96.5	90+	Pass
473	8/29/24	North Berm East Toe	165.3'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	133.5	6.2	99.9	90+	Pass
474	8/29/24	North Berm West Toe	165'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	127.0	5.9	95.0	90+	Pass
475	8/29/24	North Berm West Toe	165.8'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	129.2	6.3	96.6	90+	Pass
476	9/4/24	North Basin see sketch	169.9'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	130.8	8.7	96.1	90+	Pass
477	9/4/24	North Basin see sketch	169.7'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	129.6	8.5	95.2	90+	Pass
478	9/4/24	North Basin see sketch	169.5'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	130.1	6.4	95.6	90+	Pass
479	9/4/24	North Basin see sketch	170.3'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	130.9	7.5	96.2	90+	Pass
480	9/4/24	North Basin see sketch	169.5'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	131.3	7.4	96.5	90+	Pass
Soil Field Testing Notes and/or Observations											

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	August 29, 2024
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Sunny, warm, 60°-75° °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
(1) Large Excavator
(2) Bulldozers
(1) Large Single Drum Vibratory Roller

Arriving onsite this morning as scheduled, the undersigned observer met with Mr. Mike Bates, the site superintendent, who requested compaction testing on the north berm of the southwest basin.

During this visit, a total of eight (8) nuclear moisture/density readings (tests #468 through #475) were performed. All of the results met the stated 90% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Mr. Bates was made aware of today's field compaction test results prior to my departure. At that time, he stated that our office would be contacted when further testing is required.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet.

Report By: Anthony Courteau

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26023

8/29/24

REV. NO.	DATE	DRWN	CHKD	REMARKS
3	4/2023	JD	KU	UPDATED TEE STONE
2	1/2023	MAT	KU	REMOVED POST-CLOSURE LAND USE MATERIAL (MOUNT AREA
1	1/2023	JD	KU	ADDED TO RESPOND TO CONSERVATION COMMISSION PEER REVIEWER COMMENTS

DESIGNED BY: D. HOWARD
DRAWN BY: J. HOL
CHECKED BY: C. DAIGL
APPROVED BY: K. JONES
DATE: MARCH 2023

CDM Smith
75 State Street, Suite 701
Boston, MA 02109
Tel. (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

OVERALL SITE KEY PLAN

PROJECT NO. 0230-1.391
FILE NAME: G003KYPL.DWG
SHEET NO. G-3

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	**JBS//Andover Ledge Road SLF**	**Project No#**	**26023**
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
466	8/13/24	Berm Area see sketch	164'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	129.3	8.5	97.6	90+	Pass
467	8/13/24	Berm Area see sketch	164'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	130.8	8.8	98.7	90+	Pass
468	8/29/24	North Berm South	169.8'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	132.2	7.9	98.9	90+	Pass
469	8/29/24	North Berm South Central	170'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	131.0	6.2	98.0	90+	Pass
470	8/29/24	North Berm North Central	171.2'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	129.2	5.8	96.6	90+	Pass
471	8/29/24	North Berm North	171.5'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	129.4	7.0	96.8	90+	Pass
472	8/29/24	North Berm West Toe	166.2'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	129.0	6.1	96.5	90+	Pass
473	8/29/24	North Berm East Toe	165.3'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	133.5	6.2	99.9	90+	Pass
474	8/29/24	North Berm West Toe	165'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	127.0	5.9	95.0	90+	Pass
475	8/29/24	North Berm West Toe	165.8'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	129.2	6.3	96.6	90+	Pass
476	9/4/24	North Basin see sketch	169.9'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	130.8	8.7	96.1	90+	Pass
477	9/4/24	North Basin see sketch	169.7'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	129.6	8.5	95.2	90+	Pass
478	9/4/24	North Basin see sketch	169.5'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	130.1	6.4	95.6	90+	Pass
479	9/4/24	North Basin see sketch	170.3'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	130.9	7.5	96.2	90+	Pass
480	9/4/24	North Basin see sketch	169.5'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	131.3	7.4	96.5	90+	Pass
Soil Field Testing Notes and/or Observations											

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	September 4, 2024
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Sunny, 55°-80° °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
(1) Large Bulldozer (1) Large Riding Vibratory Roller

Arriving onsite this afternoon as scheduled, the undersigned observer met with Mr. Andrew Carr, the project foreman, who requested compaction testing on a portion of the north basin berm.

A review of the site work areas found the crew in the process of placing and compacting, with a large riding vibratory roller, a 1' lift of brown 3" max silty sand/gravel material in the abovementioned area.

During this visit, a total of ten (10) nuclear moisture/density readings (tests #476 through #485) were performed. All of the results met the stated 90% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Mr. Carr was made aware of today's field compaction test results prior to my departure.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet and field sketch.

Report By: Rez Sbat

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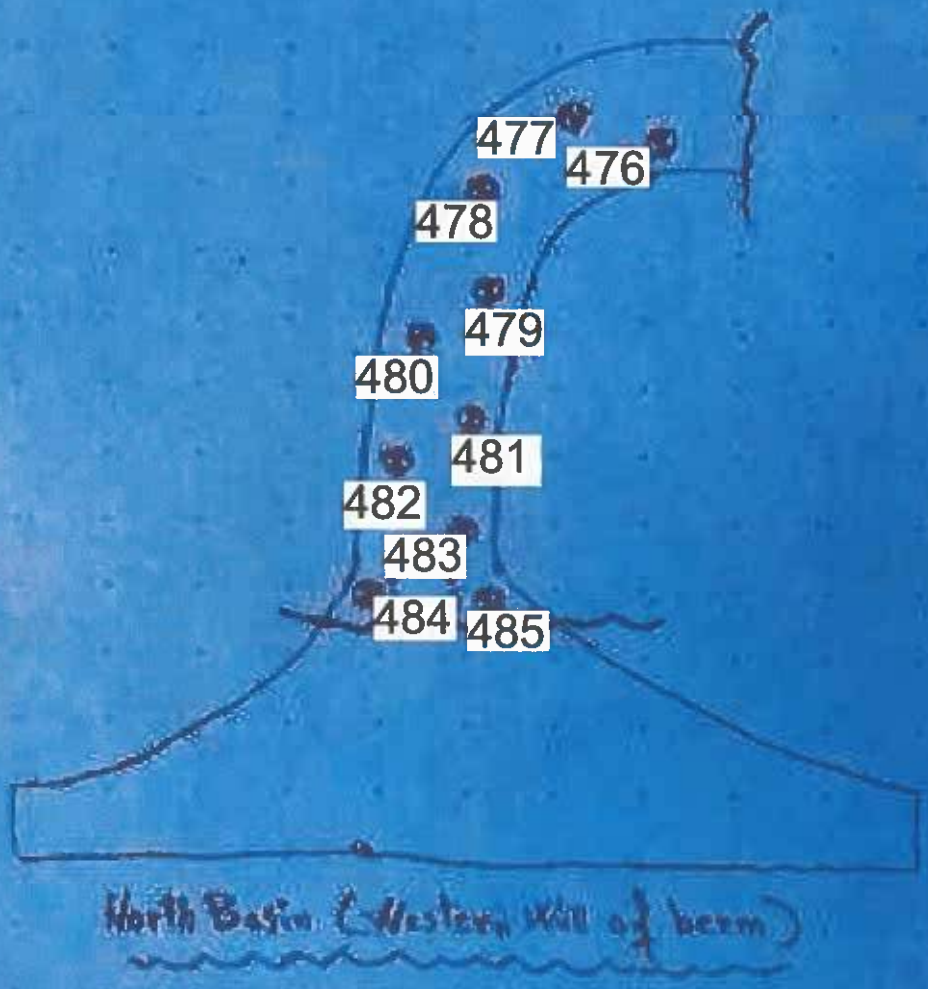
Yankee Engineering & Testing, Inc.

Project Field Sketch

Project: Ledge Rd SLF — Date: 9-30-20

Location: Andover, MA — Job No#: 20-273



SKETCH MAY NOT BE TO SCALE

10 Mason Street · Worcester, MA · 01609
Phone (508) 853-7404 · Fax (508) 831-7883

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
466	8/13/24	Berm Area see sketch	164'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	129.3	8.5	97.6	90+	Pass
467	8/13/24	Berm Area see sketch	164'	Dark brown 2" max silty sand and gravel (L-33618)	132.5	6.7	130.8	8.8	98.7	90+	Pass
468	8/29/24	North Berm South	169.8'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	132.2	7.9	98.9	90+	Pass
469	8/29/24	North Berm South Central	170'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	131.0	6.2	98.0	90+	Pass
470	8/29/24	North Berm North Central	171.2'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	129.2	5.8	96.6	90+	Pass
471	8/29/24	North Berm North	171.5'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	129.4	7.0	96.8	90+	Pass
472	8/29/24	North Berm West Toe	166.2'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	129.0	6.1	96.5	90+	Pass
473	8/29/24	North Berm East Toe	165.3'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	133.5	6.2	99.9	90+	Pass
474	8/29/24	North Berm West Toe	165'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	127.0	5.9	95.0	90+	Pass
475	8/29/24	North Berm West Toe	165.8'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	129.2	6.3	96.6	90+	Pass
476	9/4/24	North Basin see sketch	169.9'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	130.8	8.7	96.1	90+	Pass
477	9/4/24	North Basin see sketch	169.7'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	129.6	8.5	95.2	90+	Pass
478	9/4/24	North Basin see sketch	169.5'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	130.1	6.4	95.6	90+	Pass
479	9/4/24	North Basin see sketch	170.3'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	130.9	7.5	96.2	90+	Pass
480	9/4/24	North Basin see sketch	169.5'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	131.3	7.4	96.5	90+	Pass
Soil Field Testing Notes and/or Observations											

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
481	9/4/24	North Basin see sketch	168.7'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	133.0	6.0	97.7	90+	Pass
482	9/4/24	North Basin see sketch	168.3'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	132.7	6.2	97.5	90+	Pass
483	9/4/24	North Basin see sketch	167.5'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	130.1	6.5	95.6	90+	Pass
484	9/4/24	North Basin see sketch	166.9'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	131.2	6.9	96.4	90+	Pass
485	9/4/24	North Basin see sketch	165.7'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	130.2	6.6	95.7	90+	Pass
486	9/5/24	North Basin Bottom - East	SG	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	124.9	5.4	93.4	90+	Pass
487	9/5/24	North Basin Bottom - West	SG	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	125.8	5.8	94.1	90+	Pass
488	9/5/24	North Basin South Slope - West	SG	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	126.2	6.3	94.4	90+	Pass
489	9/5/24	North Basin South Slope - East	SG	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	127.8	6.1	95.6	90+	Pass
490	9/5/24	North Basin South Berm - East	SG	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	128.3	5.7	96.0	90+	Pass
491	9/5/24	North Basin South Berm - West	SG	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	123.8	6.2	92.6	90+	Pass
492	9/5/24	North Basin West Berm - South	SG	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	122.9	5.5	91.9	90+	Pass
493	9/5/24	North Basin West Berm - North	SG	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	125.1	5.7	93.6	90+	Pass
494	9/5/24	North Basin West Slope - South	SG	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	125.1	5.4	93.6	90+	Pass
495	9/5/24	North Basin West Slope - North	SG	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	124.1	5.9	92.8	90+	Pass

Soil Field Testing Notes and/or Observations	SG = Subgrade

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	September 5, 2024
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Mostly sunny, mild, 60°-75° °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
(1) Bulldozer (1) 10 Ton Vibratory Roller

Arriving onsite this afternoon as scheduled, the undersigned observer met with Mr. Mike Bates, the project superintendent, who requested monitoring and compaction testing on the ongoing earthwork operations.

A review of the site work areas found that, prior to my arrival, the subcontractor's crew had placed a 1'± lift of the offsite brown silty sand and gravel in the north basin, to approximately subgrade elevation.

Throughout this visit, the site crew applied compaction, with 5 to 6 passes of the 10 ton vibratory roller, to the offsite soils at the bottom, south slope, south berm, west berm, and west slope of the north basin.

During this visit, a total of ten (10) nuclear moisture/density readings (tests #486 through #495) were performed. All of the results met the stated 90% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Mr. Bates was made aware of today's field compaction test results prior to my departure. At that time, he stated that our office would be contacted when further testing is required.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet.

Report By: Art Swanson

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	JBS//Andover Ledge Road SLF	Project No#	26023
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
481	9/4/24	North Basin see sketch	168.7'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	133.0	6.0	97.7	90+	Pass
482	9/4/24	North Basin see sketch	168.3'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	132.7	6.2	97.5	90+	Pass
483	9/4/24	North Basin see sketch	167.5'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	130.1	6.5	95.6	90+	Pass
484	9/4/24	North Basin see sketch	166.9'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	131.2	6.9	96.4	90+	Pass
485	9/4/24	North Basin see sketch	165.7'	Brown 3" max silty sand and gravel (L-34498)	136.1	6.3	130.2	6.6	95.7	90+	Pass
486	9/5/24	North Basin Bottom - East	SG	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	124.9	5.4	93.4	90+	Pass
487	9/5/24	North Basin Bottom - West	SG	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	125.8	5.8	94.1	90+	Pass
488	9/5/24	North Basin South Slope - West	SG	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	126.2	6.3	94.4	90+	Pass
489	9/5/24	North Basin South Slope - East	SG	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	127.8	6.1	95.6	90+	Pass
490	9/5/24	North Basin South Berm - East	SG	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	128.3	5.7	96.0	90+	Pass
491	9/5/24	North Basin South Berm - West	SG	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	123.8	6.2	92.6	90+	Pass
492	9/5/24	North Basin West Berm - South	SG	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	122.9	5.5	91.9	90+	Pass
493	9/5/24	North Basin West Berm - North	SG	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	125.1	5.7	93.6	90+	Pass
494	9/5/24	North Basin West Slope - South	SG	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	125.1	5.4	93.6	90+	Pass
495	9/5/24	North Basin West Slope - North	SG	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	124.1	5.9	92.8	90+	Pass

Soil Field Testing Notes and/or Observations	SG = Subgrade

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Yankee Engineering and Testing, Inc.

Soil Testing Field Report

Project No:	26023	**Date:**	September 6, 2024
Project:	JBS//Andover Ledge Road SLF	**Client:**	J. Bates & Son, LLC
Address:	Ledge Road, Andover MA	**Weather:**	Cloudy, warm, 55°-75° °F
Contractor	J. Bates & Son, LLC	**Subcontractor:**	

Purpose: Spot-check the ongoing earthwork operations/procedures and to perform field compaction tests using a nuclear moisture/density gauge.

Construction Equipment Operating In Test Areas During Visit:
(1) Large Excavator
(2) Bulldozers
(1) Large Single Drum Vibratory Roller

Arriving onsite this morning as scheduled, the undersigned observer met with Mr. Mike Bates, the project superintendent, who requested compaction testing on the northwest berm of the north basin.

A review of the site work areas found that the area to be tested had been prepared prior to my arrival.

During this visit, a total of eight (8) nuclear moisture/density readings (tests #496 through #503) were performed. All of the results met the stated 90% minimum compaction requirement, based on the applied soil proctor value on file, indicating satisfactory compaction at the tested elevations/locations.

Mr. Bates was made aware of today's field compaction test results prior to my departure. At that time, he stated that our office would be contacted when further testing is required.

For individual soil test results, elevations, and approximate locations please refer to the accompanying compaction summary sheet.

Report By: Anthony Courteau

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

26023

9/6/24

REV. NO.	DATE	DRWN	CHKD	REMARKS
3	2/27/24	JH	ML	UPDATED TEN BASINS
2	11/7/23	KMA	ML	REMOVED NON-CLOSURE AREA PER MATERIALS ANALYSIS AREA
1	5/8/23	JH	ML	REVISED TO RESPOND TO COMMENTS FROM REVIEW MEMBERS (DAVID P.)

DSN: G. HOWARD
DWN: K. HEIL
CHK'D BY: C. DANIEL
CHK'D BY: K. JONES
APPROVED BY: K. JONES
DATE: MARCH, 2023

CDM Smith
75 State Street, Suite 701
Boston, MA 02109
Tel: (617) 452-6000

TOWN OF ANDOVER, MASSACHUSETTS
LEDGE ROAD LANDFILL CLOSURE PROJECT

OVERALL SITE KEY PLAN

PROJECT NO. 03339-381
FILE NAME: COOSKYPL.DWG
SHEET NO. G-3

XREFs: [Xrefbind Survey Dwg - USGS 2-2-16, Full Site Survey Revised 5.11.16, COOTOPO, 16365-CS-SV] images: [ ]
Saved by: rdiaz on Wednesday, April 17, 2024 - 11:35:51 AM
Plotted by: rdiaz on Wednesday, April 17, 2024 - 11:36:11 AM
Design Services File: ...\COOSKYPL.dwg
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Yankee Engineering and Testing, Inc.

SOIL COMPACTION RESULTS SUMMARY

Project Name	**JBS//Andover Ledge Road SLF**	**Project No#**	**26023**
Project Address	Ledge Road, Andover MA		

Test No.	Date of Test	Test Location or General Test Area	Lift or Elev	Field Soil Description (visual estimate)	Max Dry Density (pcf)	Optimum Moisture (%)	Dry Density (pcf)	Field Moisture (%)	Comp-action (%)	Min. Spec (%)	Pass or Fail
496	9/6/24	Northwest Berm West	175.4'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	128.0	6.8	95.7	90+	Pass
497	9/6/24	Northwest Berm West	175'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	131.1	6.6	98.1	90+	Pass
498	9/6/24	Northwest Berm West	175'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	130.9	6.7	97.9	90+	Pass
499	9/6/24	Northwest Berm Southwest	175.4'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	128.2	6.6	95.9	90+	Pass
500	9/6/24	Northwest Berm Southwest	175.4'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	127.2	7.5	95.1	90+	Pass
501	9/6/24	Northwest Berm Southwest	175'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	128.0	7.3	95.7	90+	Pass
502	9/6/24	Northwest Berm South	174'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	131.5	7.1	98.4	90+	Pass
503	9/6/24	Northwest Berm Southeast	173'	Dark brown 3" max silty sand some gravel (L-34497)	133.7	6.2	127.0	6.8	95.0	90+	Pass

Soil Field Testing Notes and/or Observations

Field Testing Performed using a Nuclear Moisture/Density Gauge (per ASTM D-6938) Unless Otherwise Noted

10 Mason Street, Worcester, MA 01609
Phone (508) 831-7404 • Fax (508) 831-7388

Appendix F-3 Coarse Sand Test Results

Yankee Engineering & Testing, Inc.

January 22, 2024

Mr. John Bates
J. Bates & Son, LLC
57 Lawrence Street
Clinton MA 01510

RE: Soil & Permeability Test Results
Andover Ledge Rd SLF
Andover, NH **Project # 26023**

Dear Mr. Bates:

Presented herein are the results of laboratory testing on a sample SP tan m/f sand little gravel trace silt (**#L-33968**), submitted on January 18, 2024. Testing consisted of a one-point constant head permeability test (ASTM D-2434).

The permeability specimen was then prepared by compacting a calculated quantity of soil into a 1/30 cubic foot rigid mold. The test conditions and result are summarized on the Table below:

 # L-33968 New Boston Pit NH
USCS Soil Classification = SP tan m/f sand little gravel trace silt

Estimated Compaction (%)	Permeability (cm/sec)
90	1.1×10^{-2}

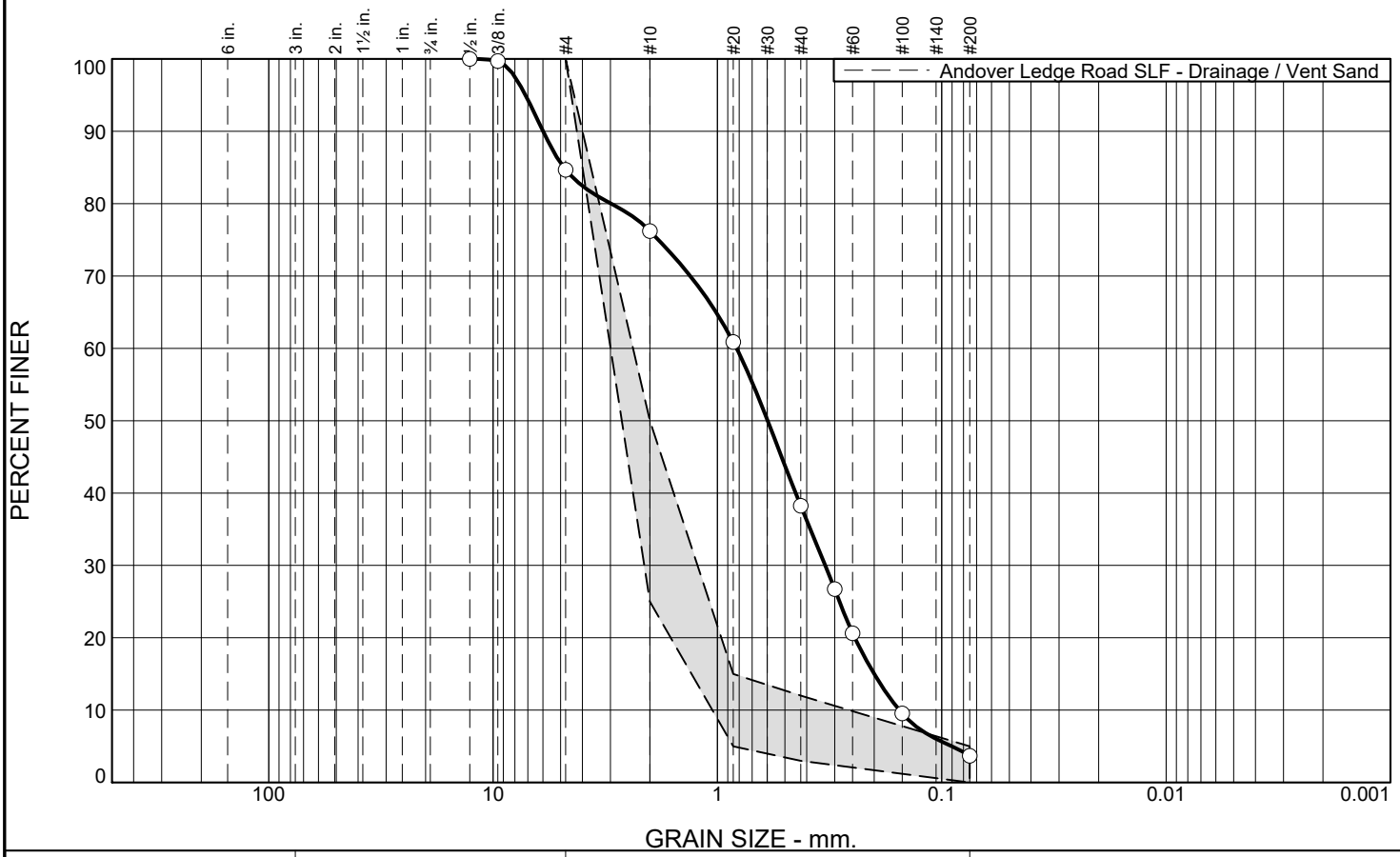
As can be seen above, the soil in question showed a permeability of 1.1×10^{-2} when compacted to approximately 90%, which met "Coarse Gas Venting" layer specification of 1×10^{-3} cm/sec and very close to "Drainage" layer specification 1.2×10^{-2} However, it should be noted that the permeability of cohesionless soils is inversely related to the degree of compaction but independent of the compacted moisture content.

Should you have any questions, or wish to discuss the above soil test results or attached gradation ("sieve") curve, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines
	Coarse	Fine	Coarse	Medium	Fine	
0.0	0.0	15.3	8.5	38.0	34.5	3.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	99.7		
#4	84.7	100	X
#10	76.2	25-50	X
#20	60.9	5-15	X
#40	38.2	3-12	X
#50	26.7		
#60	20.6		
#100	9.5		
#200	3.7	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan 1/2" max m/f sand little gravel trace silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 4.8438 D_{60}= 0.8216 D_{50}= 0.5973
D_{30}= 0.3310 D_{15}= 0.2001 D_{10}= 0.1546
C_u= 5.31 C_c= 0.86

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample submitted by client on 01/18/24
Did not meet project "Coarse Sand" gradation table

Sample No.: L-33968 **Source of Sample:** Ledge Rd - Andover MA **Date:** 1/22/24
Location: New Boston Pit NH - Granular Fill **Elev./Depth:** submitted

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

ANALYTICAL REPORT

Lab Number:	L2402923
Client:	J. Bates & Son, LLC P.O Box 997 Clinton, MA 01510
ATTN:	Seth Mcnally
Phone:	(978) 368-7001
Project Name:	ANDOVER LF
Project Number:	Not Specified
Report Date:	01/25/24

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2402923
Report Date: 01/25/24

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2402923-01	NEW BOSTON SAND	SOLID	ANDOVER, MA	01/18/24 09:25	01/18/24

Project Name:	ANDOVER LF	**Lab Number:**	L2402923
Project Number:	Not Specified	**Report Date:**	01/25/24

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	YES

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	ANDOVER LF	**Lab Number:**	L2402923
Project Number:	Not Specified	**Report Date:**	01/25/24

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: ANDOVER LF **Lab Number:** L2402923
Project Number: Not Specified **Report Date:** 01/25/24

Case Narrative (continued)

MCP Related Narratives

Sample Receipt

In reference to question H:

A Matrix Spike was not submitted for the analysis of Total Metals.

Volatile Organics

In reference to question H:

L2402923-01: Initial Calibration did not meet:

Lowest Calibration Standard Minimum Response Factor: bromochloromethane (0.0682), trichloroethene (0.1718), 1,2-dichloropropane (0.1835), bromodichloromethane (0.2601), cis-1,3-dichloropropene (0.2716), 1,1,2-trichloroethane (0.1747)

Verification: carbon disulfide (68%)

L2402923-01: The associated continuing calibration standard is outside the acceptance criteria for several compounds; however, it is within overall method allowances. Associated results are considered to be biased high if the %D is negative and biased low if the %D is positive. A copy of the continuing calibration standard is included as an addendum to this report.

Total Metals

In reference to question H:

The WG1875843-3 LCSD recovery, associated with L2402923-01, is outside the acceptance criteria for beryllium (122%). Re-analysis of the LCSD yielded an unacceptable recovery for beryllium (129%). The LCS recovery is acceptable; therefore, no further action was taken.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Cristin Walker

Title: Technical Director/Representative Date: 01/25/24

QC OUTLIER SUMMARY REPORT

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2402923
Report Date: 01/25/24

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment
MCP Volatile Organics by EPA 5035 Low - Westborough Lab								
8260D	Batch QC	WG1877214-3	Bromomethane	LCS	136	70-130	01	potential high bias
8260D	Batch QC	WG1877214-3	Vinyl chloride	LCS	134	70-130	01	potential high bias
8260D	Batch QC	WG1877214-4	Acetone	LCSD	23	20	01	non-directional bias
MCP Semivolatile Organics - Westborough Lab								
8270E	Batch QC	WG1876111-2	Aniline	LCS	34	40-140	01	potential low bias
8270E	Batch QC	WG1876111-2	2,4-Dinitrophenol	LCS	18	30-130	01	potential low bias
8270E	Batch QC	WG1876111-3	Bis(2-chloroethyl)ether	LCSD	31	30	01	non-directional bias
8270E	Batch QC	WG1876111-3	Bis(2-chloroisopropyl)ether	LCSD	38	30	01	non-directional bias
8270E	Batch QC	WG1876111-3	Benzo(ghi)perylene	LCSD	62	30	01	non-directional bias
8270E	Batch QC	WG1876111-3	Dibenzo(a,h)anthracene	LCSD	46	30	01	non-directional bias
8270E	Batch QC	WG1876111-3	Indeno(1,2,3-cd)pyrene	LCSD	55	30	01	non-directional bias
8270E	Batch QC	WG1876111-3	Aniline	LCSD	32	40-140	01	potential low bias
8270E	Batch QC	WG1876111-3	2,4-Dinitrophenol	LCSD	15	30-130	01	potential low bias
MCP Total Metals - Mansfield Lab								
6010D	Batch QC	WG1875843-3	Beryllium, Total	LCSD	122	83-117	01	potential high bias

ORGANICS

VOLATILES

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402923
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2402923-01
Client ID: NEW BOSTON SAND
Sample Location: ANDOVER, MA
Date Collected: 01/18/24 09:25
Date Received: 01/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Solid
Analytical Method: 141,8260D
Analytical Date: 01/22/24 10:40
Analyst: JIC
Percent Solids: 97%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Methylene chloride	ND		ug/kg	2.9	--	1
1,1-Dichloroethane	ND		ug/kg	0.58	--	1
Chloroform	ND		ug/kg	0.86	--	1
Carbon tetrachloride	ND		ug/kg	0.58	--	1
1,2-Dichloropropane	ND		ug/kg	0.58	--	1
Dibromochloromethane	ND		ug/kg	0.58	--	1
1,1,2-Trichloroethane	ND		ug/kg	0.58	--	1
Tetrachloroethene	ND		ug/kg	0.29	--	1
Chlorobenzene	ND		ug/kg	0.29	--	1
Trichlorofluoromethane	ND		ug/kg	2.3	--	1
1,2-Dichloroethane	ND		ug/kg	0.58	--	1
1,1,1-Trichloroethane	ND		ug/kg	0.29	--	1
Bromodichloromethane	ND		ug/kg	0.29	--	1
trans-1,3-Dichloropropene	ND		ug/kg	0.58	--	1
cis-1,3-Dichloropropene	ND		ug/kg	0.29	--	1
1,3-Dichloropropene, Total	ND		ug/kg	0.29	--	1
1,1-Dichloropropene	ND		ug/kg	0.29	--	1
Bromoform	ND		ug/kg	2.3	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.29	--	1
Benzene	ND		ug/kg	0.29	--	1
Toluene	ND		ug/kg	0.58	--	1
Ethylbenzene	ND		ug/kg	0.58	--	1
Chloromethane	ND		ug/kg	2.3	--	1
Bromomethane	ND		ug/kg	1.2	--	1
Vinyl chloride	ND		ug/kg	0.58	--	1
Chloroethane	ND		ug/kg	1.2	--	1
1,1-Dichloroethene	ND		ug/kg	0.58	--	1
trans-1,2-Dichloroethene	ND		ug/kg	0.86	--	1

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402923
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2402923-01
Client ID: NEW BOSTON SAND
Sample Location: ANDOVER, MA
Date Collected: 01/18/24 09:25
Date Received: 01/18/24
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Trichloroethene	ND		ug/kg	0.29	--	1
1,2-Dichlorobenzene	ND		ug/kg	1.2	--	1
1,3-Dichlorobenzene	ND		ug/kg	1.2	--	1
1,4-Dichlorobenzene	ND		ug/kg	1.2	--	1
Methyl tert butyl ether	ND		ug/kg	1.2	--	1
p/m-Xylene	ND		ug/kg	1.2	--	1
o-Xylene	ND		ug/kg	0.58	--	1
Xylenes, Total	ND		ug/kg	0.58	--	1
cis-1,2-Dichloroethene	ND		ug/kg	0.58	--	1
1,2-Dichloroethene, Total	ND		ug/kg	0.58	--	1
Dibromomethane	ND		ug/kg	1.2	--	1
1,2,3-Trichloropropane	ND		ug/kg	1.2	--	1
Styrene	ND		ug/kg	0.58	--	1
Dichlorodifluoromethane	ND		ug/kg	5.8	--	1
Acetone	ND		ug/kg	14	--	1
Carbon disulfide	ND		ug/kg	5.8	--	1
Methyl ethyl ketone	ND		ug/kg	5.8	--	1
Methyl isobutyl ketone	ND		ug/kg	5.8	--	1
2-Hexanone	ND		ug/kg	5.8	--	1
Bromochloromethane	ND		ug/kg	1.2	--	1
Tetrahydrofuran	ND		ug/kg	2.3	--	1
2,2-Dichloropropane	ND		ug/kg	1.2	--	1
1,2-Dibromoethane	ND		ug/kg	0.58	--	1
1,3-Dichloropropane	ND		ug/kg	1.2	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	0.29	--	1
Bromobenzene	ND		ug/kg	1.2	--	1
n-Butylbenzene	ND		ug/kg	0.58	--	1
sec-Butylbenzene	ND		ug/kg	0.58	--	1
tert-Butylbenzene	ND		ug/kg	1.2	--	1
o-Chlorotoluene	ND		ug/kg	1.2	--	1
p-Chlorotoluene	ND		ug/kg	1.2	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	1.7	--	1
Hexachlorobutadiene	ND		ug/kg	2.3	--	1
Isopropylbenzene	ND		ug/kg	0.58	--	1
p-Isopropyltoluene	ND		ug/kg	0.58	--	1
Naphthalene	ND		ug/kg	2.3	--	1
n-Propylbenzene	ND		ug/kg	0.58	--	1

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402923
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2402923-01
Client ID: NEW BOSTON SAND
Sample Location: ANDOVER, MA
Date Collected: 01/18/24 09:25
Date Received: 01/18/24
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	1.2	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	1.2	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	1.2	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	1.2	--	1
Diethyl ether	ND		ug/kg	1.2	--	1
Diisopropyl Ether	ND		ug/kg	1.2	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	1.2	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	1.2	--	1
1,4-Dioxane	ND		ug/kg	46	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	96		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	98		70-130
Dibromofluoromethane	101		70-130

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402923
Report Date: 01/25/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 01/22/24 10:15
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1877214-5					
Methylene chloride	ND		ug/kg	5.0	--
1,1-Dichloroethane	ND		ug/kg	1.0	--
Chloroform	ND		ug/kg	1.5	--
Carbon tetrachloride	ND		ug/kg	1.0	--
1,2-Dichloropropane	ND		ug/kg	1.0	--
Dibromochloromethane	ND		ug/kg	1.0	--
1,1,2-Trichloroethane	ND		ug/kg	1.0	--
Tetrachloroethene	ND		ug/kg	0.50	--
Chlorobenzene	ND		ug/kg	0.50	--
Trichlorofluoromethane	ND		ug/kg	4.0	--
1,2-Dichloroethane	ND		ug/kg	1.0	--
1,1,1-Trichloroethane	ND		ug/kg	0.50	--
Bromodichloromethane	ND		ug/kg	0.50	--
trans-1,3-Dichloropropene	ND		ug/kg	1.0	--
cis-1,3-Dichloropropene	ND		ug/kg	0.50	--
1,3-Dichloropropene, Total	ND		ug/kg	0.50	--
1,1-Dichloropropene	ND		ug/kg	0.50	--
Bromoform	ND		ug/kg	4.0	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.50	--
Benzene	ND		ug/kg	0.50	--
Toluene	ND		ug/kg	1.0	--
Ethylbenzene	ND		ug/kg	1.0	--
Chloromethane	ND		ug/kg	4.0	--
Bromomethane	ND		ug/kg	2.0	--
Vinyl chloride	ND		ug/kg	1.0	--
Chloroethane	ND		ug/kg	2.0	--
1,1-Dichloroethene	ND		ug/kg	1.0	--
trans-1,2-Dichloroethene	ND		ug/kg	1.5	--
Trichloroethene	ND		ug/kg	0.50	--

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402923
Report Date: 01/25/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 01/22/24 10:15
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1877214-5					
1,2-Dichlorobenzene	ND		ug/kg	2.0	--
1,3-Dichlorobenzene	ND		ug/kg	2.0	--
1,4-Dichlorobenzene	ND		ug/kg	2.0	--
Methyl tert butyl ether	ND		ug/kg	2.0	--
p/m-Xylene	ND		ug/kg	2.0	--
o-Xylene	ND		ug/kg	1.0	--
Xylenes, Total	ND		ug/kg	1.0	--
cis-1,2-Dichloroethene	ND		ug/kg	1.0	--
1,2-Dichloroethene, Total	ND		ug/kg	1.0	--
Dibromomethane	ND		ug/kg	2.0	--
1,2,3-Trichloropropane	ND		ug/kg	2.0	--
Styrene	ND		ug/kg	1.0	--
Dichlorodifluoromethane	ND		ug/kg	10	--
Acetone	ND		ug/kg	25	--
Carbon disulfide	ND		ug/kg	10	--
Methyl ethyl ketone	ND		ug/kg	10	--
Methyl isobutyl ketone	ND		ug/kg	10	--
2-Hexanone	ND		ug/kg	10	--
Bromochloromethane	ND		ug/kg	2.0	--
Tetrahydrofuran	ND		ug/kg	4.0	--
2,2-Dichloropropane	ND		ug/kg	2.0	--
1,2-Dibromoethane	ND		ug/kg	1.0	--
1,3-Dichloropropane	ND		ug/kg	2.0	--
1,1,1,2-Tetrachloroethane	ND		ug/kg	0.50	--
Bromobenzene	ND		ug/kg	2.0	--
n-Butylbenzene	ND		ug/kg	1.0	--
sec-Butylbenzene	ND		ug/kg	1.0	--
tert-Butylbenzene	ND		ug/kg	2.0	--
o-Chlorotoluene	ND		ug/kg	2.0	--

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402923
Report Date: 01/25/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 01/22/24 10:15
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1877214-5					
p-Chlorotoluene	ND		ug/kg	2.0	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	3.0	--
Hexachlorobutadiene	ND		ug/kg	4.0	--
Isopropylbenzene	ND		ug/kg	1.0	--
p-Isopropyltoluene	ND		ug/kg	1.0	--
Naphthalene	ND		ug/kg	4.0	--
n-Propylbenzene	ND		ug/kg	1.0	--
1,2,3-Trichlorobenzene	ND		ug/kg	2.0	--
1,2,4-Trichlorobenzene	ND		ug/kg	2.0	--
1,3,5-Trimethylbenzene	ND		ug/kg	2.0	--
1,2,4-Trimethylbenzene	ND		ug/kg	2.0	--
Diethyl ether	ND		ug/kg	2.0	--
Diisopropyl Ether	ND		ug/kg	2.0	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	2.0	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	2.0	--
1,4-Dioxane	ND		ug/kg	80	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	96		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	98		70-130
Dibromofluoromethane	101		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2402923
Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1877214-3 WG1877214-4								
Methylene chloride	106		98		70-130	8		20
1,1-Dichloroethane	112		103		70-130	8		20
Chloroform	109		102		70-130	7		20
Carbon tetrachloride	106		98		70-130	8		20
1,2-Dichloropropane	110		104		70-130	6		20
Dibromochloromethane	102		101		70-130	1		20
1,1,2-Trichloroethane	107		102		70-130	5		20
Tetrachloroethene	115		106		70-130	8		20
Chlorobenzene	106		100		70-130	6		20
Trichlorofluoromethane	114		104		70-130	9		20
1,2-Dichloroethane	102		98		70-130	4		20
1,1,1-Trichloroethane	112		103		70-130	8		20
Bromodichloromethane	107		102		70-130	5		20
trans-1,3-Dichloropropene	103		99		70-130	4		20
cis-1,3-Dichloropropene	109		106		70-130	3		20
1,1-Dichloropropene	118		106		70-130	11		20
Bromoform	98		96		70-130	2		20
1,1,2,2-Tetrachloroethane	100		98		70-130	2		20
Benzene	112		103		70-130	8		20
Toluene	108		99		70-130	9		20
Ethylbenzene	107		99		70-130	8		20
Chloromethane	128		113		70-130	12		20
Bromomethane	**136**	Q	125		70-130	8		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2402923
Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1877214-3 WG1877214-4								
Vinyl chloride	**134**	Q	119		70-130	12		20
Chloroethane	116		105		70-130	10		20
1,1-Dichloroethene	115		105		70-130	9		20
trans-1,2-Dichloroethene	115		105		70-130	9		20
Trichloroethene	114		106		70-130	7		20
1,2-Dichlorobenzene	102		97		70-130	5		20
1,3-Dichlorobenzene	102		97		70-130	5		20
1,4-Dichlorobenzene	101		96		70-130	5		20
Methyl tert butyl ether	105		101		70-130	4		20
p/m-Xylene	109		102		70-130	7		20
o-Xylene	106		101		70-130	5		20
cis-1,2-Dichloroethene	110		103		70-130	7		20
Dibromomethane	108		104		70-130	4		20
1,2,3-Trichloropropane	98		96		70-130	2		20
Styrene	105		100		70-130	5		20
Dichlorodifluoromethane	115		100		70-130	14		20
Acetone	124		98		70-130	**23**	Q	20
Carbon disulfide	119		104		70-130	13		20
Methyl ethyl ketone	102		101		70-130	1		20
Methyl isobutyl ketone	99		95		70-130	4		20
2-Hexanone	98		93		70-130	5		20
Bromochloromethane	112		106		70-130	6		20
Tetrahydrofuran	105		99		70-130	6		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2402923
Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1877214-3 WG1877214-4								
2,2-Dichloropropane	108		99		70-130	9		20
1,2-Dibromoethane	95		93		70-130	2		20
1,3-Dichloropropane	106		102		70-130	4		20
1,1,1,2-Tetrachloroethane	92		89		70-130	3		20
Bromobenzene	100		95		70-130	5		20
n-Butylbenzene	108		98		70-130	10		20
sec-Butylbenzene	106		97		70-130	9		20
tert-Butylbenzene	104		96		70-130	8		20
o-Chlorotoluene	102		95		70-130	7		20
p-Chlorotoluene	102		95		70-130	7		20
1,2-Dibromo-3-chloropropane	92		90		70-130	2		20
Hexachlorobutadiene	101		93		70-130	8		20
Isopropylbenzene	105		97		70-130	8		20
p-Isopropyltoluene	105		97		70-130	8		20
Naphthalene	101		99		70-130	2		20
n-Propylbenzene	104		97		70-130	7		20
1,2,3-Trichlorobenzene	102		98		70-130	4		20
1,2,4-Trichlorobenzene	104		98		70-130	6		20
1,3,5-Trimethylbenzene	103		97		70-130	6		20
1,2,4-Trimethylbenzene	103		97		70-130	6		20
Diethyl ether	114		112		70-130	2		20
Diisopropyl Ether	109		103		70-130	6		20
Ethyl-Tert-Butyl-Ether	107		102		70-130	5		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: ANDOVER LF

Project Number: Not Specified

Lab Number: L2402923

Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1877214-3 WG1877214-4								
Tertiary-Amyl Methyl Ether	105		101		70-130	4		20
1,4-Dioxane	95		94		70-130	1		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	94		94		70-130
Toluene-d8	99		98		70-130
4-Bromofluorobenzene	96		97		70-130
Dibromofluoromethane	101		101		70-130

SEMIVOLATILES

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402923
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2402923-01
Client ID: NEW BOSTON SAND
Sample Location: ANDOVER, MA

Date Collected: 01/18/24 09:25
Date Received: 01/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Solid
Analytical Method: 141,8270E
Analytical Date: 01/21/24 21:20
Analyst: SZ
Percent Solids: 97%

Extraction Method: EPA 3540C
Extraction Date: 01/19/24 11:25

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	140	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	170	--	1
Hexachlorobenzene	ND		ug/kg	72	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	72	--	1
2-Chloronaphthalene	ND		ug/kg	170	--	1
1,2-Dichlorobenzene	ND		ug/kg	170	--	1
1,3-Dichlorobenzene	ND		ug/kg	170	--	1
1,4-Dichlorobenzene	ND		ug/kg	72	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	170	--	1
2,4-Dinitrotoluene	ND		ug/kg	72	--	1
2,6-Dinitrotoluene	ND		ug/kg	170	--	1
Azobenzene	ND		ug/kg	170	--	1
Fluoranthene	ND		ug/kg	100	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	170	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	72	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	180	--	1
Hexachlorobutadiene	ND		ug/kg	170	--	1
Hexachloroethane	ND		ug/kg	72	--	1
Isophorone	ND		ug/kg	150	--	1
Naphthalene	ND		ug/kg	170	--	1
Nitrobenzene	ND		ug/kg	150	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	170	--	1
Butyl benzyl phthalate	ND		ug/kg	170	--	1
Di-n-butylphthalate	ND		ug/kg	170	--	1
Di-n-octylphthalate	ND		ug/kg	170	--	1
Diethyl phthalate	ND		ug/kg	170	--	1
Dimethyl phthalate	ND		ug/kg	72	--	1
Benzo(a)anthracene	ND		ug/kg	100	--	1

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402923
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2402923-01
Client ID: NEW BOSTON SAND
Sample Location: ANDOVER, MA
Date Collected: 01/18/24 09:25
Date Received: 01/18/24
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(a)pyrene	ND		ug/kg	140	--	1
Benzo(b)fluoranthene	ND		ug/kg	100	--	1
Benzo(k)fluoranthene	ND		ug/kg	100	--	1
Chrysene	ND		ug/kg	100	--	1
Acenaphthylene	ND		ug/kg	140	--	1
Anthracene	ND		ug/kg	100	--	1
Benzo(ghi)perylene	ND		ug/kg	140	--	1
Fluorene	ND		ug/kg	170	--	1
Phenanthrene	ND		ug/kg	100	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	72	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	140	--	1
Pyrene	ND		ug/kg	100	--	1
Aniline	ND		ug/kg	200	--	1
4-Chloroaniline	ND		ug/kg	170	--	1
Dibenzofuran	ND		ug/kg	170	--	1
2-Methylnaphthalene	ND		ug/kg	72	--	1
Acetophenone	ND		ug/kg	170	--	1
2,4,6-Trichlorophenol	ND		ug/kg	72	--	1
2-Chlorophenol	ND		ug/kg	72	--	1
2,4-Dichlorophenol	ND		ug/kg	72	--	1
2,4-Dimethylphenol	ND		ug/kg	72	--	1
2-Nitrophenol	ND		ug/kg	370	--	1
4-Nitrophenol	ND		ug/kg	240	--	1
2,4-Dinitrophenol	ND		ug/kg	820	--	1
Pentachlorophenol	ND		ug/kg	340	--	1
Phenol	ND		ug/kg	170	--	1
2-Methylphenol	ND		ug/kg	170	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	250	--	1
2,4,5-Trichlorophenol	ND		ug/kg	170	--	1
Pyridine	ND		ug/kg	180	--	1
Biphenyl	ND		ug/kg	34	--	1

Project Name: ANDOVER LF
Lab Number: L2402923
Project Number: Not Specified
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2402923-01
Client ID: NEW BOSTON SAND
Sample Location: ANDOVER, MA
Date Collected: 01/18/24 09:25
Date Received: 01/18/24
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	52		30-130
Phenol-d6	54		30-130
Nitrobenzene-d5	47		30-130
2-Fluorobiphenyl	61		30-130
2,4,6-Tribromophenol	46		30-130
4-Terphenyl-d14	66		30-130

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2402923
Report Date: 01/25/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E
Analytical Date: 01/21/24 17:26
Analyst: SZ

Extraction Method: EPA 3540C
Extraction Date: 01/19/24 11:25

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01 Batch: WG1876111-1					
Acenaphthene	ND		ug/kg	130	--
1,2,4-Trichlorobenzene	ND		ug/kg	160	--
Hexachlorobenzene	ND		ug/kg	69	--
Bis(2-chloroethyl)ether	ND		ug/kg	69	--
2-Chloronaphthalene	ND		ug/kg	160	--
1,2-Dichlorobenzene	ND		ug/kg	160	--
1,3-Dichlorobenzene	ND		ug/kg	160	--
1,4-Dichlorobenzene	ND		ug/kg	69	--
3,3'-Dichlorobenzidine	ND		ug/kg	160	--
2,4-Dinitrotoluene	ND		ug/kg	69	--
2,6-Dinitrotoluene	ND		ug/kg	160	--
Azobenzene	ND		ug/kg	160	--
Fluoranthene	ND		ug/kg	99	--
4-Bromophenyl phenyl ether	ND		ug/kg	160	--
Bis(2-chloroisopropyl)ether	ND		ug/kg	69	--
Bis(2-chloroethoxy)methane	ND		ug/kg	180	--
Hexachlorobutadiene	ND		ug/kg	160	--
Hexachloroethane	ND		ug/kg	69	--
Isophorone	ND		ug/kg	150	--
Naphthalene	ND		ug/kg	160	--
Nitrobenzene	ND		ug/kg	150	--
Bis(2-ethylhexyl)phthalate	ND		ug/kg	160	--
Butyl benzyl phthalate	ND		ug/kg	160	--
Di-n-butylphthalate	ND		ug/kg	160	--
Di-n-octylphthalate	ND		ug/kg	160	--
Diethyl phthalate	ND		ug/kg	160	--
Dimethyl phthalate	ND		ug/kg	69	--
Benzo(a)anthracene	ND		ug/kg	99	--
Benzo(a)pyrene	ND		ug/kg	130	--

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402923
Report Date: 01/25/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E
Analytical Date: 01/21/24 17:26
Analyst: SZ

Extraction Method: EPA 3540C
Extraction Date: 01/19/24 11:25

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01 Batch: WG1876111-1					
Benzo(b)fluoranthene	ND		ug/kg	99	--
Benzo(k)fluoranthene	ND		ug/kg	99	--
Chrysene	ND		ug/kg	99	--
Acenaphthylene	ND		ug/kg	130	--
Anthracene	ND		ug/kg	99	--
Benzo(ghi)perylene	ND		ug/kg	130	--
Fluorene	ND		ug/kg	160	--
Phenanthrene	ND		ug/kg	99	--
Dibenzo(a,h)anthracene	ND		ug/kg	69	--
Indeno(1,2,3-cd)pyrene	ND		ug/kg	130	--
Pyrene	ND		ug/kg	99	--
Aniline	ND		ug/kg	200	--
4-Chloroaniline	ND		ug/kg	160	--
Dibenzofuran	ND		ug/kg	160	--
2-Methylnaphthalene	ND		ug/kg	69	--
Acetophenone	ND		ug/kg	160	--
2,4,6-Trichlorophenol	ND		ug/kg	69	--
2-Chlorophenol	ND		ug/kg	69	--
2,4-Dichlorophenol	ND		ug/kg	69	--
2,4-Dimethylphenol	ND		ug/kg	69	--
2-Nitrophenol	ND		ug/kg	360	--
4-Nitrophenol	ND		ug/kg	230	--
2,4-Dinitrophenol	ND		ug/kg	790	--
Pentachlorophenol	ND		ug/kg	330	--
Phenol	ND		ug/kg	160	--
2-Methylphenol	ND		ug/kg	160	--
3-Methylphenol/4-Methylphenol	ND		ug/kg	240	--
2,4,5-Trichlorophenol	ND		ug/kg	160	--
Pyridine	ND		ug/kg	180	--

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402923
Report Date: 01/25/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E
Analytical Date: 01/21/24 17:26
Analyst: SZ

Extraction Method: EPA 3540C
Extraction Date: 01/19/24 11:25

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01 Batch: WG1876111-1					
Biphenyl	ND		ug/kg	33	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	62		30-130
Phenol-d6	65		30-130
Nitrobenzene-d5	64		30-130
2-Fluorobiphenyl	64		30-130
2,4,6-Tribromophenol	77		30-130
4-Terphenyl-d14	73		30-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2402923
Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01 Batch: WG1876111-2 WG1876111-3								
Acenaphthene	68		58		40-140	16		30
1,2,4-Trichlorobenzene	64		59		40-140	8		30
Hexachlorobenzene	79		68		40-140	15		30
Bis(2-chloroethyl)ether	75		55		40-140	**31**	Q	30
2-Chloronaphthalene	66		56		40-140	16		30
1,2-Dichlorobenzene	68		56		40-140	19		30
1,3-Dichlorobenzene	62		54		40-140	14		30
1,4-Dichlorobenzene	63		54		40-140	15		30
3,3'-Dichlorobenzidine	50		47		40-140	6		30
2,4-Dinitrotoluene	69		61		40-140	12		30
2,6-Dinitrotoluene	78		67		40-140	15		30
Azobenzene	64		55		40-140	15		30
Fluoranthene	74		65		40-140	13		30
4-Bromophenyl phenyl ether	78		68		40-140	14		30
Bis(2-chloroisopropyl)ether	81		55		40-140	**38**	Q	30
Bis(2-chloroethoxy)methane	75		68		40-140	10		30
Hexachlorobutadiene	66		54		40-140	20		30
Hexachloroethane	73		56		40-140	26		30
Isophorone	79		70		40-140	12		30
Naphthalene	64		55		40-140	15		30
Nitrobenzene	81		69		40-140	16		30
Bis(2-ethylhexyl)phthalate	64		55		40-140	15		30
Butyl benzyl phthalate	74		64		40-140	14		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2402923
Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01 Batch: WG1876111-2 WG1876111-3								
Di-n-butylphthalate	75		65		40-140	14		30
Di-n-octylphthalate	67		54		40-140	21		30
Diethyl phthalate	70		61		40-140	14		30
Dimethyl phthalate	68		58		40-140	16		30
Benzo(a)anthracene	72		62		40-140	15		30
Benzo(a)pyrene	71		56		40-140	24		30
Benzo(b)fluoranthene	70		54		40-140	26		30
Benzo(k)fluoranthene	61		55		40-140	10		30
Chrysene	70		60		40-140	15		30
Acenaphthylene	64		54		40-140	17		30
Anthracene	68		60		40-140	13		30
Benzo(ghi)perylene	95		50		40-140	**62**	Q	30
Fluorene	69		59		40-140	16		30
Phenanthrene	66		58		40-140	13		30
Dibenzo(a,h)anthracene	96		60		40-140	**46**	Q	30
Indeno(1,2,3-cd)pyrene	98		56		40-140	**55**	Q	30
Pyrene	73		64		40-140	13		30
Aniline	**34**	Q	**32**	Q	40-140	6		30
4-Chloroaniline	71		62		40-140	14		30
Dibenzofuran	67		58		40-140	14		30
2-Methylnaphthalene	64		56		40-140	13		30
Acetophenone	80		60		40-140	29		30
2,4,6-Trichlorophenol	78		66		30-130	17		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2402923
Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01 Batch: WG1876111-2 WG1876111-3								
2-Chlorophenol	78		62		30-130	23		30
2,4-Dichlorophenol	73		67		30-130	9		30
2,4-Dimethylphenol	82		75		30-130	9		30
2-Nitrophenol	82		78		30-130	5		30
4-Nitrophenol	77		65		30-130	17		30
2,4-Dinitrophenol	**18**	Q	**15**	Q	30-130	18		30
Pentachlorophenol	57		52		30-130	9		30
Phenol	76		56		30-130	30		30
2-Methylphenol	79		61		30-130	26		30
3-Methylphenol/4-Methylphenol	85		66		30-130	25		30
2,4,5-Trichlorophenol	78		66		30-130	17		30
Pyridine	57		45		30-130	24		30
Biphenyl	64		54		40-140	17		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	70		65		30-130
Phenol-d6	77		58		30-130
Nitrobenzene-d5	78		65		30-130
2-Fluorobiphenyl	62		52		30-130
2,4,6-Tribromophenol	84		74		30-130
4-Terphenyl-d14	70		62		30-130

PCBS

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402923
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2402923-01
Client ID: NEW BOSTON SAND
Sample Location: ANDOVER, MA

Date Collected: 01/18/24 09:25
Date Received: 01/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Solid
Analytical Method: 97,8082A
Analytical Date: 01/20/24 14:48
Analyst: EMR
Percent Solids: 97%

Extraction Method: EPA 3540C
Extraction Date: 01/19/24 11:10
Cleanup Method: EPA 3665A
Cleanup Date: 01/20/24
Cleanup Method: EPA 3660B
Cleanup Date: 01/20/24

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	89.7	--	1	A
Aroclor 1221	ND		ug/kg	89.7	--	1	A
Aroclor 1232	ND		ug/kg	89.7	--	1	A
Aroclor 1242	ND		ug/kg	89.7	--	1	A
Aroclor 1248	ND		ug/kg	89.7	--	1	A
Aroclor 1254	ND		ug/kg	89.7	--	1	A
Aroclor 1260	ND		ug/kg	89.7	--	1	A
Aroclor 1262	ND		ug/kg	89.7	--	1	A
Aroclor 1268	ND		ug/kg	89.7	--	1	A
PCBs, Total	ND		ug/kg	89.7	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	53		30-150	A
Decachlorobiphenyl	52		30-150	A
2,4,5,6-Tetrachloro-m-xylene	51		30-150	B
Decachlorobiphenyl	45		30-150	B

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402923
Report Date: 01/25/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082A
Analytical Date: 01/20/24 14:25
Analyst: EMR

Extraction Method: EPA 3540C
Extraction Date: 01/19/24 11:10
Cleanup Method: EPA 3665A
Cleanup Date: 01/20/24
Cleanup Method: EPA 3660B
Cleanup Date: 01/20/24

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01 Batch: WG1876097-1						
Aroclor 1016	ND		ug/kg	91.4	--	A
Aroclor 1221	ND		ug/kg	91.4	--	A
Aroclor 1232	ND		ug/kg	91.4	--	A
Aroclor 1242	ND		ug/kg	91.4	--	A
Aroclor 1248	ND		ug/kg	91.4	--	A
Aroclor 1254	ND		ug/kg	91.4	--	A
Aroclor 1260	ND		ug/kg	91.4	--	A
Aroclor 1262	ND		ug/kg	91.4	--	A
Aroclor 1268	ND		ug/kg	91.4	--	A
PCBs, Total	ND		ug/kg	91.4	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	50		30-150	A
Decachlorobiphenyl	47		30-150	A
2,4,5,6-Tetrachloro-m-xylene	49		30-150	B
Decachlorobiphenyl	46		30-150	B

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2402923
Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01 Batch: WG1876097-2 WG1876097-3									
Aroclor 1016	59		57		40-140	3		30	A
Aroclor 1260	58		54		40-140	7		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	49		48		30-150	A
Decachlorobiphenyl	47		47		30-150	A
2,4,5,6-Tetrachloro-m-xylene	47		46		30-150	B
Decachlorobiphenyl	42		40		30-150	B

PESTICIDES

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402923
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2402923-01
Client ID: NEW BOSTON SAND
Sample Location: ANDOVER, MA

Date Collected: 01/18/24 09:25
Date Received: 01/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Solid
Analytical Method: 97,8081B
Analytical Date: 01/21/24 16:25
Analyst: MMG
Percent Solids: 97%

Extraction Method: EPA 3540C
Extraction Date: 01/19/24 10:20
Cleanup Method: EPA 3620B
Cleanup Date: 01/20/24
Cleanup Method: EPA 3660B
Cleanup Date: 01/20/24

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Organochlorine Pesticides - Westborough Lab							
Delta-BHC	ND		ug/kg	4.28	--	1	A
Lindane	ND		ug/kg	1.43	--	1	A
Alpha-BHC	ND		ug/kg	1.78	--	1	A
Beta-BHC	ND		ug/kg	4.28	--	1	A
Heptachlor	ND		ug/kg	2.14	--	1	A
Aldrin	ND		ug/kg	4.28	--	1	A
Heptachlor epoxide	ND		ug/kg	8.03	--	1	A
Endrin	ND		ug/kg	1.78	--	1	A
Endrin ketone	ND		ug/kg	4.28	--	1	A
Dieldrin	ND		ug/kg	2.68	--	1	A
4,4'-DDE	ND		ug/kg	4.28	--	1	A
4,4'-DDD	ND		ug/kg	4.28	--	1	A
4,4'-DDT	ND		ug/kg	8.03	--	1	A
Endosulfan I	ND		ug/kg	4.28	--	1	A
Endosulfan II	ND		ug/kg	4.28	--	1	A
Endosulfan sulfate	ND		ug/kg	1.78	--	1	A
Methoxychlor	ND		ug/kg	8.03	--	1	A
Chlordane	ND		ug/kg	35.7	--	1	A
Hexachlorobenzene	ND		ug/kg	4.28	--	1	A
Toxaphene	ND		ug/kg	80.3	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	70		30-150	A
Decachlorobiphenyl	65		30-150	A
2,4,5,6-Tetrachloro-m-xylene	67		30-150	B
Decachlorobiphenyl	77		30-150	B

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402923
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2402923-01
Client ID: NEW BOSTON SAND
Sample Location: ANDOVER, MA
Date Collected: 01/18/24 09:25
Date Received: 01/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Solid
Analytical Method: 97,8151A
Analytical Date: 01/20/24 13:38
Analyst: JAG
Percent Solids: 97%
Methylation Date: 01/19/24 18:54
Extraction Method: EPA 8151A
Extraction Date: 01/18/24 13:19

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Chlorinated Herbicides - Westborough Lab							
MCPP	ND		ug/kg	3400	--	1	A
MCPA	ND		ug/kg	3400	--	1	A
Dalapon	ND		ug/kg	34	--	1	A
Dicamba	ND		ug/kg	34	--	1	A
Dichloroprop	ND		ug/kg	34	--	1	A
2,4-D	ND		ug/kg	34	--	1	A
2,4-DB	ND		ug/kg	34	--	1	A
2,4,5-T	ND		ug/kg	34	--	1	A
2,4,5-TP (Silvex)	ND		ug/kg	34	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DCAA	82		30-150	A
DCAA	82		30-150	B

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402923
Report Date: 01/25/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8151A
Analytical Date: 01/20/24 06:54
Analyst: JAG

Extraction Method: EPA 8151A
Extraction Date: 01/18/24 07:51

Methylation Date: 01/19/24 18:54

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Chlorinated Herbicides - Westborough Lab for sample(s): 01 Batch: WG1875754-1						
MCPP	ND		ug/kg	3300	--	A
MCPA	ND		ug/kg	3300	--	A
Dalapon	ND		ug/kg	33	--	A
Dicamba	ND		ug/kg	33	--	A
Dichloroprop	ND		ug/kg	33	--	A
2,4-D	ND		ug/kg	33	--	A
2,4-DB	ND		ug/kg	33	--	A
2,4,5-T	ND		ug/kg	33	--	A
2,4,5-TP (Silvex)	ND		ug/kg	33	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
DCAA	87		30-150	A
DCAA	86		30-150	B

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402923
Report Date: 01/25/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8081B
Analytical Date: 01/21/24 15:37
Analyst: MMG

Extraction Method: EPA 3540C
Extraction Date: 01/19/24 10:20
Cleanup Method: EPA 3620B
Cleanup Date: 01/20/24
Cleanup Method: EPA 3660B
Cleanup Date: 01/20/24

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Organochlorine Pesticides - Westborough Lab for sample(s): 01 Batch: WG1876071-1						
Delta-BHC	ND		ug/kg	4.40	--	A
Lindane	ND		ug/kg	1.46	--	A
Alpha-BHC	ND		ug/kg	1.83	--	A
Beta-BHC	ND		ug/kg	4.40	--	A
Heptachlor	ND		ug/kg	2.20	--	A
Aldrin	ND		ug/kg	4.40	--	A
Heptachlor epoxide	ND		ug/kg	8.24	--	A
Endrin	ND		ug/kg	1.83	--	A
Endrin ketone	ND		ug/kg	4.40	--	A
Dieldrin	ND		ug/kg	2.75	--	A
4,4'-DDE	ND		ug/kg	4.40	--	A
4,4'-DDD	ND		ug/kg	4.40	--	A
4,4'-DDT	ND		ug/kg	8.24	--	A
Endosulfan I	ND		ug/kg	4.40	--	A
Endosulfan II	ND		ug/kg	4.40	--	A
Endosulfan sulfate	ND		ug/kg	1.83	--	A
Methoxychlor	ND		ug/kg	8.24	--	A
Chlordane	ND		ug/kg	36.6	--	A
Hexachlorobenzene	ND		ug/kg	4.40	--	A
Toxaphene	ND		ug/kg	82.4	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	67		30-150	A
Decachlorobiphenyl	61		30-150	A
2,4,5,6-Tetrachloro-m-xylene	68		30-150	B
Decachlorobiphenyl	69		30-150	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: ANDOVER LF

Project Number: Not Specified

Lab Number: L2402923

Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Chlorinated Herbicides - Westborough Lab Associated sample(s): 01 Batch: WG1875754-2 WG1875754-3									
MCPP	110		107		40-140	3		30	A
MCPA	92		87		40-140	6		30	A
Dalapon	75		76		40-140	1		30	A
Dicamba	96		91		40-140	5		30	A
Dichloroprop	95		90		40-140	5		30	A
2,4-D	94		93		40-140	1		30	A
2,4-DB	83		69		40-140	18		30	A
2,4,5-T	95		94		40-140	1		30	A
2,4,5-TP (Silvex)	95		91		40-140	4		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
DCAA	86		83		30-150	A
DCAA	101		98		30-150	B

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2402923
Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Organochlorine Pesticides - Westborough Lab Associated sample(s): 01 Batch: WG1876071-2 WG1876071-3									
Delta-BHC	75		66		40-140	13		30	A
Lindane	77		67		40-140	14		30	A
Alpha-BHC	76		66		40-140	14		30	A
Beta-BHC	98		77		40-140	24		30	A
Heptachlor	76		67		40-140	13		30	A
Aldrin	76		66		40-140	14		30	A
Heptachlor epoxide	58		58		40-140	0		30	A
Endrin	80		70		40-140	13		30	A
Endrin ketone	80		72		40-140	11		30	A
Dieldrin	85		74		40-140	14		30	A
4,4'-DDE	77		68		40-140	12		30	A
4,4'-DDD	79		70		40-140	12		30	A
4,4'-DDT	85		76		40-140	11		30	A
Endosulfan I	76		66		40-140	14		30	A
Endosulfan II	82		72		40-140	13		30	A
Endosulfan sulfate	75		68		40-140	10		30	A
Methoxychlor	80		72		40-140	11		30	A
Hexachlorobenzene	71		63		40-140	12		30	A

Lab Control Sample Analysis

Batch Quality Control

Project Name: ANDOVER LF

Project Number: Not Specified

Lab Number: L2402923

Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Organochlorine Pesticides - Westborough Lab Associated sample(s): 01 Batch: WG1876071-2 WG1876071-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	70		62		30-150	A
Decachlorobiphenyl	65		55		30-150	A
2,4,5,6-Tetrachloro-m-xylene	72		61		30-150	B
Decachlorobiphenyl	73		66		30-150	B

METALS

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402923
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2402923-01
Client ID: NEW BOSTON SAND
Sample Location: ANDOVER, MA
Date Collected: 01/18/24 09:25
Date Received: 01/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Solid
Percent Solids: 97%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.01	--	1	01/19/24 01:50	01/19/24 10:32	EPA 3050B	97,6010D	DMC
Arsenic, Total	6.25		mg/kg	0.402	--	1	01/19/24 01:50	01/19/24 10:32	EPA 3050B	97,6010D	DMC
Barium, Total	13.6		mg/kg	0.402	--	1	01/19/24 01:50	01/19/24 10:32	EPA 3050B	97,6010D	DMC
Beryllium, Total	ND		mg/kg	0.201	--	1	01/19/24 01:50	01/19/24 10:32	EPA 3050B	97,6010D	DMC
Cadmium, Total	ND		mg/kg	0.402	--	1	01/19/24 01:50	01/19/24 10:32	EPA 3050B	97,6010D	DMC
Chromium, Total	4.63		mg/kg	0.402	--	1	01/19/24 01:50	01/19/24 10:32	EPA 3050B	97,6010D	DMC
Lead, Total	2.02		mg/kg	2.01	--	1	01/19/24 01:50	01/19/24 10:32	EPA 3050B	97,6010D	DMC
Mercury, Total	ND		mg/kg	0.074	--	1	01/19/24 02:05	01/19/24 23:18	EPA 7471B	97,7471B	GMG
Nickel, Total	3.21		mg/kg	1.00	--	1	01/19/24 01:50	01/19/24 10:32	EPA 3050B	97,6010D	DMC
Selenium, Total	ND		mg/kg	2.01	--	1	01/19/24 01:50	01/19/24 10:32	EPA 3050B	97,6010D	DMC
Silver, Total	ND		mg/kg	0.402	--	1	01/19/24 01:50	01/19/24 10:32	EPA 3050B	97,6010D	DMC
Thallium, Total	ND		mg/kg	2.01	--	1	01/19/24 01:50	01/19/24 10:32	EPA 3050B	97,6010D	DMC
Vanadium, Total	6.22		mg/kg	0.402	--	1	01/19/24 01:50	01/19/24 10:32	EPA 3050B	97,6010D	DMC
Zinc, Total	10.1		mg/kg	2.01	--	1	01/19/24 01:50	01/19/24 10:32	EPA 3050B	97,6010D	DMC

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2402923
Report Date: 01/25/24

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1875843-1										
Antimony, Total	ND		mg/kg	2.00	--	1	01/19/24 01:50	01/19/24 10:03	97,6010D	DMC
Arsenic, Total	ND		mg/kg	0.400	--	1	01/19/24 01:50	01/19/24 10:03	97,6010D	DMC
Barium, Total	ND		mg/kg	0.400	--	1	01/19/24 01:50	01/19/24 10:03	97,6010D	DMC
Beryllium, Total	ND		mg/kg	0.200	--	1	01/19/24 01:50	01/19/24 10:03	97,6010D	DMC
Cadmium, Total	ND		mg/kg	0.400	--	1	01/19/24 01:50	01/19/24 10:03	97,6010D	DMC
Chromium, Total	ND		mg/kg	0.400	--	1	01/19/24 01:50	01/19/24 10:03	97,6010D	DMC
Lead, Total	ND		mg/kg	2.00	--	1	01/19/24 01:50	01/19/24 10:03	97,6010D	DMC
Nickel, Total	ND		mg/kg	1.00	--	1	01/19/24 01:50	01/19/24 10:03	97,6010D	DMC
Selenium, Total	ND		mg/kg	2.00	--	1	01/19/24 01:50	01/19/24 10:03	97,6010D	DMC
Silver, Total	ND		mg/kg	0.400	--	1	01/19/24 01:50	01/19/24 10:03	97,6010D	DMC
Thallium, Total	ND		mg/kg	2.00	--	1	01/19/24 01:50	01/19/24 10:03	97,6010D	DMC
Vanadium, Total	ND		mg/kg	0.400	--	1	01/19/24 01:50	01/19/24 10:03	97,6010D	DMC
Zinc, Total	ND		mg/kg	2.00	--	1	01/19/24 01:50	01/19/24 10:03	97,6010D	DMC

Prep Information

Digestion Method: EPA 3050B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1875844-1										
Mercury, Total	ND		mg/kg	0.083	--	1	01/19/24 02:05	01/19/24 23:02	97,7471B	GMG

Prep Information

Digestion Method: EPA 7471B

Lab Control Sample Analysis

Batch Quality Control

Project Name: ANDOVER LF

Project Number: Not Specified

Lab Number: L2402923

Report Date: 01/25/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1875843-2 WG1875843-3 SRM Lot Number: D122-540								
Antimony, Total	151		161		6-194	6		30
Arsenic, Total	106		112		81-119	6		30
Barium, Total	97		116		83-117	18		30
Beryllium, Total	106		**122**	Q	83-117	14		30
Cadmium, Total	98		105		83-117	7		30
Chromium, Total	102		110		82-118	8		30
Lead, Total	102		108		83-117	6		30
Nickel, Total	101		107		83-117	6		30
Selenium, Total	110		119		81-119	8		30
Silver, Total	110		117		80-120	6		30
Thallium, Total	100		107		81-119	7		30
Vanadium, Total	99		106		80-120	7		30
Zinc, Total	103		108		82-119	5		30
MCP Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1875844-2 WG1875844-3 SRM Lot Number: D122-540								
Mercury, Total	101		96		73-127	5		30

INORGANICS
&
MISCELLANEOUS

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2402923
Report Date: 01/25/24

SAMPLE RESULTS

Lab ID: L2402923-01
Client ID: NEW BOSTON SAND
Sample Location: ANDOVER, MA

Date Collected: 01/18/24 09:25
Date Received: 01/18/24
Field Prep: Not Specified

Sample Depth:
Matrix: Solid

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	96.8		%	0.100	NA	1	-	01/18/24 11:54	121,2540G	ROI

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2402923
Report Date: 01/25/24

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2402923-01A	Vial MeOH preserved	A	NA		4.1	Y	Absent		MCP-8260HLW-21(14)
L2402923-01B	Vial water preserved	A	NA		4.1	Y	Absent	18-JAN-24 11:35	MCP-8260HLW-21(14)
L2402923-01C	Vial water preserved	A	NA		4.1	Y	Absent	18-JAN-24 11:35	MCP-8260HLW-21(14)
L2402923-01D	Plastic 2oz unpreserved for TS	A	NA		4.1	Y	Absent		TS(7)
L2402923-01E	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.1	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-TL-6010T-10(180),MCP-ZN-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-V-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L2402923-01F	Glass 500ml/16oz unpreserved	A	NA		4.1	Y	Absent		MCP-8151-10(14),MCP-8081-10(14),MCP-8082-10-3540C(365),MCP-8270-21(14)

*Values in parentheses indicate holding time in days

Project Name:	ANDOVER LF	**Lab Number:**	L2402923
Project Number:	Not Specified	**Report Date:**	01/25/24

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name:	ANDOVER LF	**Lab Number:**	L2402923
Project Number:	Not Specified	**Report Date:**	01/25/24

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report

Project Name:	ANDOVER LF	**Lab Number:**	L2402923
Project Number:	Not Specified	**Report Date:**	01/25/24

Data Qualifiers

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: Data Usability Report

Project Name:	ANDOVER LF	**Lab Number:**	L2402923
Project Number:	Not Specified	**Report Date:**	01/25/24

REFERENCES

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010 and WSC-CAM-IIIA and IIID, January 2024.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

141 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA and IIB, November 2021.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

ALPHA ANALYTICAL
8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220
320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Date Rec'd in Lab: 1/18/24

ALPHA Job #: L2402923

Client Information

Client: J Bates and Son
Address: 57 Lawrence St
Clinton, MA 01510
Phone: 978-368-7001
Email: smcnally@jbatesandson.com

Project Information

Project Name: Andover LF
Project Location: Andover MA
Project #:
Project Manager: Jennifer Byrnes
ALPHA Quote #: 452519

Report Information - Data Deliverables

☐ ADEx ☑ EMAIL

Billing Information

☑ Same as Client info PO #: Andover

Regulatory Requirements & Project Information Requirements

☑ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods
☐ Yes ☐ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☐ No NPDES RGP
☐ Other State /Fed Program _____ Criteria _____

Turn-Around Time

☑ Standard ☐ RUSH (only confirmed if pre-approved)
Date Due:

Additional Project Information:

See bottle req order
#452519 for analysis

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	ANALYSIS	SAMPLE INFO	TOTAL # BOTTLES
02923 -01	New Boston Sand	1/18/24	9:25		SMcN	VOC: ☐ 8260 ☐ 624 ☐ 524.2; SVOC: ☐ ABN ☐ PAH; METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15; METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13; EPH: ☐ Ranges & Targets ☐ Ranges Only; VPH: ☐ Ranges & Targets ☐ Ranges Only; ☐ PCB ☐ PEST; TPH: ☐ Quant Only ☐ Fingerprint	Filtration ☐ Field ☐ Lab to do; Preservation ☐ Lab to do; Sample Comments	

Container Type	
Preservative	

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H = $Na_2S_2O_3$
I= Ascorbic Acid
J = NH_4Cl
K= Zn Acetate
O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
Barry Hoag	1/18/24 10:40	CJ Dean AAL	1/18/24 1040

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

Serial_No:01252411:53

Bottle Order Request

Bottle Order # 452519

Acctnum : JBATES
Company : J. Bates & Son, LLC
Contact Name : Seth McNally
Client PM :
Projectnum :
Projectname :

Request date : 01/17/24
Status : NEED
Sample delivery date :
Order taken by : Mark Oliver
Linked Call :
Projected TAT :

Completed by :
Delivery method : P/U Flanders am
Date Completed :

Matrix : SOIL
 # Samples : 2
Client IDs : 1

Analytes : Total Solids - SM 2540
MCP 8081B - Organochlorine Pesticides
MCP 5035/8260D VOCs - High & Low Level
MCP 8270E - Semivolatile Organics
MCP 8082A - Polychlorinated Biphenyls
MCP 6010D/7470A - Total MCP 14 Metals
MCP 8151A - Chlorinated Herbicides

0 Trip Blanks

Container	Quantity	Analyte Label
Glass 500ml/16oz unpreserved	1	MCP-8270-21 MCP-8081-10 MCP-8082-10 MCP-8151-10
Metals Only-Glass 60mL/2oz unpr	1	MCP14
Plastic 2oz unpreserved for TS	1	TS
5 mL Syringe for VOA	1	
Vial MeOH preserved	1	MCP-8260HLW-21 (High)
Vial water preserved	2	MCP-8260HLW-21 (Low)

Bottle Quantity Summary:

5 mL Syringe for VOA	2
Glass 500ml/16oz unpreserved	2
Metals Only-Glass 60mL/2oz unpr	2
Plastic 2oz unpreserved for TS	2
Vial MeOH preserved	2
Vial water preserved	4

Trip Blanks and Miscellaneous Field Blanks:

Special Shipping Requirements

Cooler [x] Dangerous Certified NJ Courier Pickup Label Return Shipping Labels

Pending Shipping Date(s)
01/18/24

PLEASE PUT SAMPLES ON ICE
EXCEPT CANISTER OR BAG SAMPLES

Method Blank Summary
Form 4
Volatiles

Client	: J. Bates & Son, LLC	**Lab Number**	: L2402923
Project Name	: ANDOVER LF	**Project Number**	:
Lab Sample ID	: WG1877214-5	**Lab File ID**	: V1124022A05
Instrument ID	: VOA111		
Matrix	: SOLID	**Analysis Date**	: 01/22/24 10:15

Client Sample No.	Lab Sample ID	Analysis Date
WG1877214-3LCS	WG1877214-3	01/22/24 08:34
WG1877214-4LCSD	WG1877214-4	01/22/24 08:59
NEW BOSTON SAND	L2402923-01	01/22/24 10:40

Calibration Verification Summary
Form 7
Volatiles

Client	: J. Bates & Son, LLC	**Lab Number**	: L2402923
Project Name	: ANDOVER LF	**Project Number**	:
Instrument ID	: VOA111	**Calibration Date**	: 01/22/24 08:34
Lab File ID	: V1124022A01	**Init. Calib. Date(s)**	: 01/12/24 01/12/24
Sample No	: WG1877214-2	**Init. Calib. Times**	: 14:08 18:47
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
Fluorobenzene	1	1	-	0	20	81	0
Dichlorodifluoromethane	0.241	0.276	-	-14.5	20	106	0
Chloromethane	0.233	0.298	-	-27.9*	20	109	0
Vinyl chloride	0.278	0.372	-	-33.8*	20	118	0
Bromomethane	0.186	0.253	-	-36*	20	124	0
Chloroethane	0.164	0.191	-	-16.5	20	105	0
Trichlorofluoromethane	0.335	0.382	-	-14	20	105	0
Ethyl ether	0.109	0.125	-	-14.7	20	86	0
1,1-Dichloroethene	0.191	0.22	-	-15.2	20	103	0
Carbon disulfide	0.712	0.849	-	-19.2	20	110	0
Freon-113	0.209	0.231	-	-10.5	20	107	0
Acrolein	0.029	0.032	-	-10.3	20	92	0
Methylene chloride	0.254	0.269	-	-5.9	20	92	0
Acetone	0.054	0.067	-	-24.1*	20	103	0
trans-1,2-Dichloroethene	0.223	0.257	-	-15.2	20	96	0
Methyl acetate	0.119	0.114	-	4.2	20	80	0
Methyl tert-butyl ether	0.654	0.686	-	-4.9	20	84	0
tert-Butyl alcohol	0.025	0.021	-	16	20	68	0
Diisopropyl ether	0.725	0.791	-	-9.1	20	88	0
1,1-Dichloroethane	0.437	0.491	-	-12.4	20	93	0
Halothane	0.175	0.188	-	-7.4	20	96	0
Acrylonitrile	0.058	0.062	-	-6.9	20	87	0
Ethyl tert-butyl ether	0.777	0.831	-	-6.9	20	86	0
Vinyl acetate	0.49	0.473	-	3.5	20	81	0
cis-1,2-Dichloroethene	0.259	0.285	-	-10	20	90	0
2,2-Dichloropropane	0.369	0.4	-	-8.4	20	94	0
Bromochloromethane	0.109	0.122	-	-11.9	20	85	0
Cyclohexane	0.356	0.421	-	-18.3	20	112	0
Chloroform	0.455	0.495	-	-8.8	20	91	0
Ethyl acetate	0.186	0.183	-	1.6	20	80	0
Carbon tetrachloride	0.332	0.352	-	-6	20	96	0
Tetrahydrofuran	0.05	0.052	-	-4	20	82	-.01
Dibromofluoromethane	0.244	0.246	-	-0.8	20	81	0
1,1,1-Trichloroethane	0.368	0.411	-	-11.7	20	96	0
2-Butanone	0.077	0.079	-	-2.6	20	85	0
1,1-Dichloropropene	0.3	0.356	-	-18.7	20	101	0
Benzene	0.905	1.01	-	-11.6	20	92	0
tert-Amyl methyl ether	0.686	0.719	-	-4.8	20	83	0
1,2-Dichloroethane-d4	0.272	0.256	-	5.9	20	77	0
1,2-Dichloroethane	0.333	0.341	-	-2.4	20	83	0
Methyl cyclohexane	0.385	0.434	-	-12.7	20	104	0
Trichloroethene	0.234	0.268	-	-14.5	20	94	0
Dibromomethane	0.142	0.153	-	-7.7	20	84	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: J. Bates & Son, LLC	**Lab Number**	: L2402923
Project Name	: ANDOVER LF	**Project Number**	:
Instrument ID	: VOA111	**Calibration Date**	: 01/22/24 08:34
Lab File ID	: V1124022A01	**Init. Calib. Date(s)**	: 01/12/24 01/12/24
Sample No	: WG1877214-2	**Init. Calib. Times**	: 14:08 18:47
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
1,2-Dichloropropane	0.242	0.267	-	-10.3	20	88	0
2-Chloroethyl vinyl ether	40	45.355	-	-13.4	20	105	0
Bromodichloromethane	0.343	0.367	-	-7	20	83	0
1,4-Dioxane	2000	1900.148	-	5	20	87	0
cis-1,3-Dichloropropene	0.383	0.419	-	-9.4	20	84	0
Chlorobenzene-d5	1	1	-	0	20	82	0
Toluene-d8	1.356	1.348	-	0.6	20	82	0
Toluene	0.815	0.876	-	-7.5	20	92	0
4-Methyl-2-pentanone	0.104	0.102	-	1.9	20	82	0
Tetrachloroethene	0.311	0.358	-	-15.1	20	98	0
trans-1,3-Dichloropropene	0.5	0.514	-	-2.8	20	82	0
Ethyl methacrylate	0.355	0.346	-	2.5	20	77	0
1,1,2-Trichloroethane	0.231	0.248	-	-7.4	20	85	0
Chlorodibromomethane	0.333	0.342	-	-2.7	20	81	0
1,3-Dichloropropane	0.474	0.503	-	-6.1	20	85	0
1,2-Dibromoethane	40	38.109	-	4.7	20	83	0
2-Hexanone	0.17	0.166	-	2.4	20	81	0
Chlorobenzene	0.906	0.958	-	-5.7	20	88	0
Ethylbenzene	1.598	1.704	-	-6.6	20	93	0
1,1,1,2-Tetrachloroethane	40	36.64	-	8.4	20	82	0
p/m Xylene	0.591	0.644	-	-9	20	92	0
o Xylene	0.583	0.62	-	-6.3	20	88	0
Styrene	1.011	1.061	-	-4.9	20	87	0
1,4-Dichlorobenzene-d4	1	1	-	0	20	83	0
Bromoform	0.425	0.416	-	2.1	20	78	0
Isopropylbenzene	2.988	3.142	-	-5.2	20	94	0
4-Bromofluorobenzene	0.945	0.903	-	4.4	20	79	0
Bromobenzene	0.751	0.749	-	0.3	20	84	0
n-Propylbenzene	3.674	3.835	-	-4.4	20	93	0
1,4-Dichlorobutane	0.906	0.895	-	1.2	20	83	0
1,1,2,2-Tetrachloroethane	0.684	0.686	-	-0.3	20	82	0
4-Ethyltoluene	3.037	3.18	-	-4.7	20	92	0
2-Chlorotoluene	2.172	2.217	-	-2.1	20	88	0
1,3,5-Trimethylbenzene	2.625	2.717	-	-3.5	20	90	0
1,2,3-Trichloropropane	0.566	0.556	-	1.8	20	82	0
trans-1,4-Dichloro-2-buten	0.219	0.209	-	4.6	20	78	0
4-Chlorotoluene	2.327	2.37	-	-1.8	20	88	0
tert-Butylbenzene	2.151	2.243	-	-4.3	20	94	0
1,2,4-Trimethylbenzene	2.594	2.684	-	-3.5	20	90	0
sec-Butylbenzene	3.322	3.507	-	-5.6	20	96	0
p-Isopropyltoluene	2.806	2.947	-	-5	20	94	0
1,3-Dichlorobenzene	1.445	1.481	-	-2.5	20	87	0
1,4-Dichlorobenzene	1.478	1.498	-	-1.4	20	86	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: J. Bates & Son, LLC	**Lab Number**	: L2402923
Project Name	: ANDOVER LF	**Project Number**	:
Instrument ID	: VOA111	**Calibration Date**	: 01/22/24 08:34
Lab File ID	: V1124022A01	**Init. Calib. Date(s)**	: 01/12/24 01/12/24
Sample No	: WG1877214-2	**Init. Calib. Times**	: 14:08 18:47
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
p-Diethylbenzene	1.703	1.801	-	-5.8	20	93	0
n-Butylbenzene	2.639	2.845	-	-7.8	20	96	0
1,2-Dichlorobenzene	1.354	1.386	-	-2.4	20	87	0
1,2,4,5-Tetramethylbenzene	2.705	2.828	-	-4.5	20	90	0
1,2-Dibromo-3-chloropropan	0.109	0.1	-	8.3	20	74	0
1,3,5-Trichlorobenzene	1.119	1.16	-	-3.7	20	89	0
Hexachlorobutadiene	0.516	0.52	-	-0.8	20	92	0
1,2,4-Trichlorobenzene	0.949	0.992	-	-4.5	20	87	0
Naphthalene	1.92	1.944	-	-1.3	20	85	0
1,2,3-Trichlorobenzene	0.796	0.814	-	-2.3	20	85	0

* Value outside of QC limits.

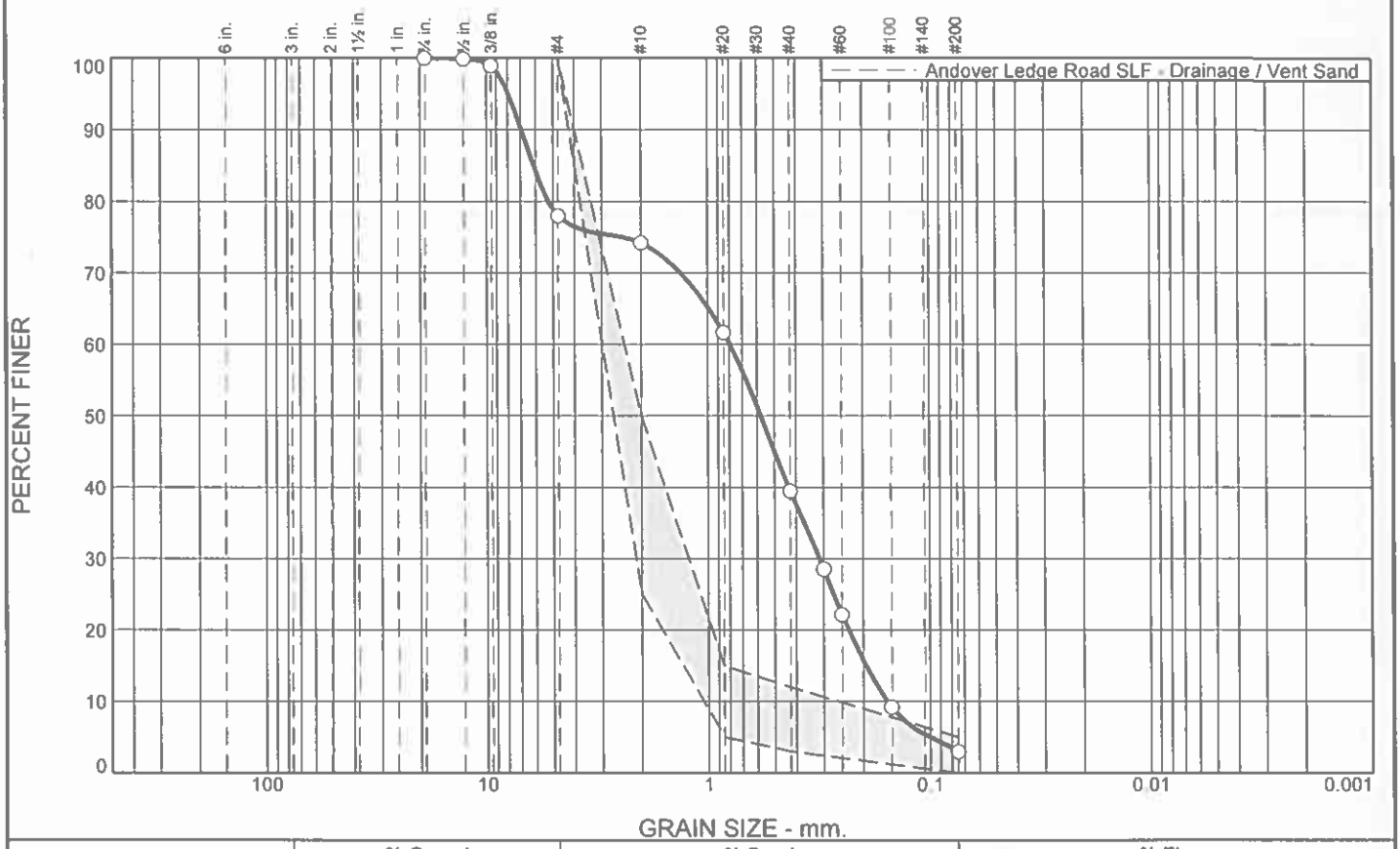
Performance Evaluation Mixture Summary
Form 15
Pesticides

Client	: J. Bates & Son, LLC	**Lab Number**	: L2402923
Project Name	: ANDOVER LF	**Project Number**	:
Instrument ID	: PEST15	**Analysis Date**	: 01/21/24 09:15
PEM Standard	: R1787101-1		
Column 1	: RTX-5	**Column 2**	: RTX-CLPPesticides2

Parameter	Signal 1	Signal 2
4,4'-DDE	314136.5462	180879.3608
Endrin	240367241.81729	140226016.39756
4,4'-DDD	3348013.25997	2032554.12784
4,4'-DDT	417728686.21317	245712869.18707
Endrin Aldehyde	348482.0688	209328.3672
Endrin Ketone	3976641.509	561782.3728

Parameter	%Breakdown 1	%Breakdown 2
Endrin	1.77	0.547
DDT	0.869	0.893

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	22.0	3.8	34.7	36.5	3.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	99.9		
3/8"	99.0		
#4	78.0	100	X
#10	74.2	25-50	X
#20	61.7	5-15	X
#40	39.5	3-12	X
#50	28.5		
#60	22.2		
#100	9.2		
#200	3.0	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan 3/4" max f/m sand some gravel trace silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 6.1308 D_{60}= 0.7953 D_{50}= 0.5792
D_{30}= 0.3137 D_{15}= 0.1946 D_{10}= 0.1566
C_u= 5.08 C_c= 0.79

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample submitted by client on 06/04/24
Did not meet project Drain sand gradation limits

Sample No.: L-34647 **Source of Sample:** Ledge Rd - Andover MA **Date:** 6/10/24
Location: DPW Co - Drain Sand **Elev./Depth:** 1500cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

June 10, 2024

Mr. John Bates
J. Bates & Son, LLC
57 Lawrence Street
Clinton MA 01510

RE: Soil & Permeability Test Results
Andover Ledge Rd SLF
Andover, NH **Project # 26023**

Dear Mr. Bates:

Presented herein are the results of laboratory testing on a sample SP tan f/m sand little gravel trace silt **(#L-34648)**, submitted on June 4, 2024. Testing consisted of a one-point constant head permeability test (ASTM D-2434).

The permeability specimen was then prepared by compacting a calculated quantity of soil into a 1/30 cubic foot rigid mold. The test conditions and result are summarized on the Table below:

 # L-34648 – Sand 3000 cy
USCS Soil Classification = SP tan f/m sand little gravel trace silt

Estimated Compaction (%)	Permeability (cm/sec)
90	2.1×10^{-2}

As can be seen above, the soil in question showed a permeability of 1.1×10^{-2} when compacted to approximately 90%, which met both "Coarse Gas Venting" layer specification of 1×10^{-3} cm/sec and "Drainage" layer specification 1.2×10^{-2} However, it should be noted that the permeability of cohesionless soils is inversely related to the degree of compaction but independent of the compacted moisture content.

Should you have any questions, or wish to discuss the above soil test results or attached gradation ("sieve") curve, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	18.7	3.7	36.5	37.3	3.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	99.7		
3/8"	98.6		
#4	81.3	100	X
#10	77.6	25-50	X
#20	64.8	5-15	X
#40	41.1	3-12	X
#50	29.5		
#60	23.5		
#100	11.2		
#200	3.8	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan 3/4" max f/m sand little gravel trace silt
D-1557 proctor = 120.2 pcf @ 7.2% optimum moisture

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 5.7225 D_{60}= 0.7197 D_{50}= 0.5436
D_{30}= 0.3044 D_{15}= 0.1810 D_{10}= 0.1393
C_u= 5.17 C_c= 0.92

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample submitted by client on 06/04/24
Did not meet project "Drain Sand" gradation limits
See perm letter for additional information

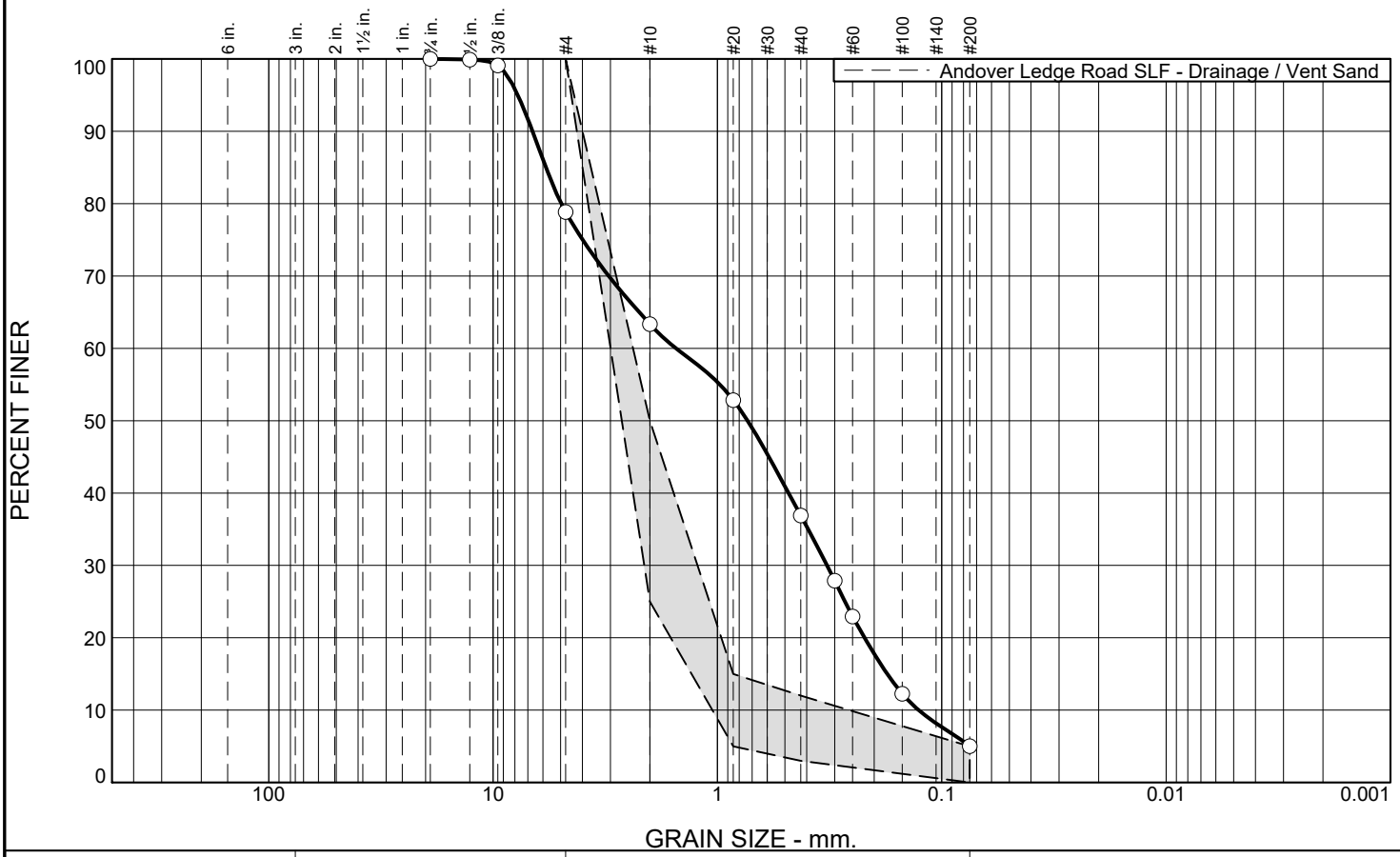
Sample No.: L-34648 **Source of Sample:** Ledge Rd - Andover MA **Date:** 6/10/24
Location: DPW Co - Drain Sand **Elev./Depth:** 3000cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	21.2	15.5	26.4	31.9	5.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	99.9		
3/8"	99.1		
#4	78.8	100	X
#10	63.3	25-50	X
#20	52.8	5-15	X
#40	36.9	3-12	X
#50	27.9		
#60	22.9		
#100	12.3		
#200	5.0	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan 3/4" max sand some gravel trace silt
Proctor test not requested

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 5.8101 D_{60}= 1.5298 D_{50}= 0.7345
D_{30}= 0.3249 D_{15}= 0.1751 D_{10}= 0.1268
C_u= 12.06 C_c= 0.54

Classification

USCS= SP-SM AASHTO= A-1-b

Remarks

Sample submitted by client on 07/18/24
Did not meet project "Coarse Sand" gradation limits

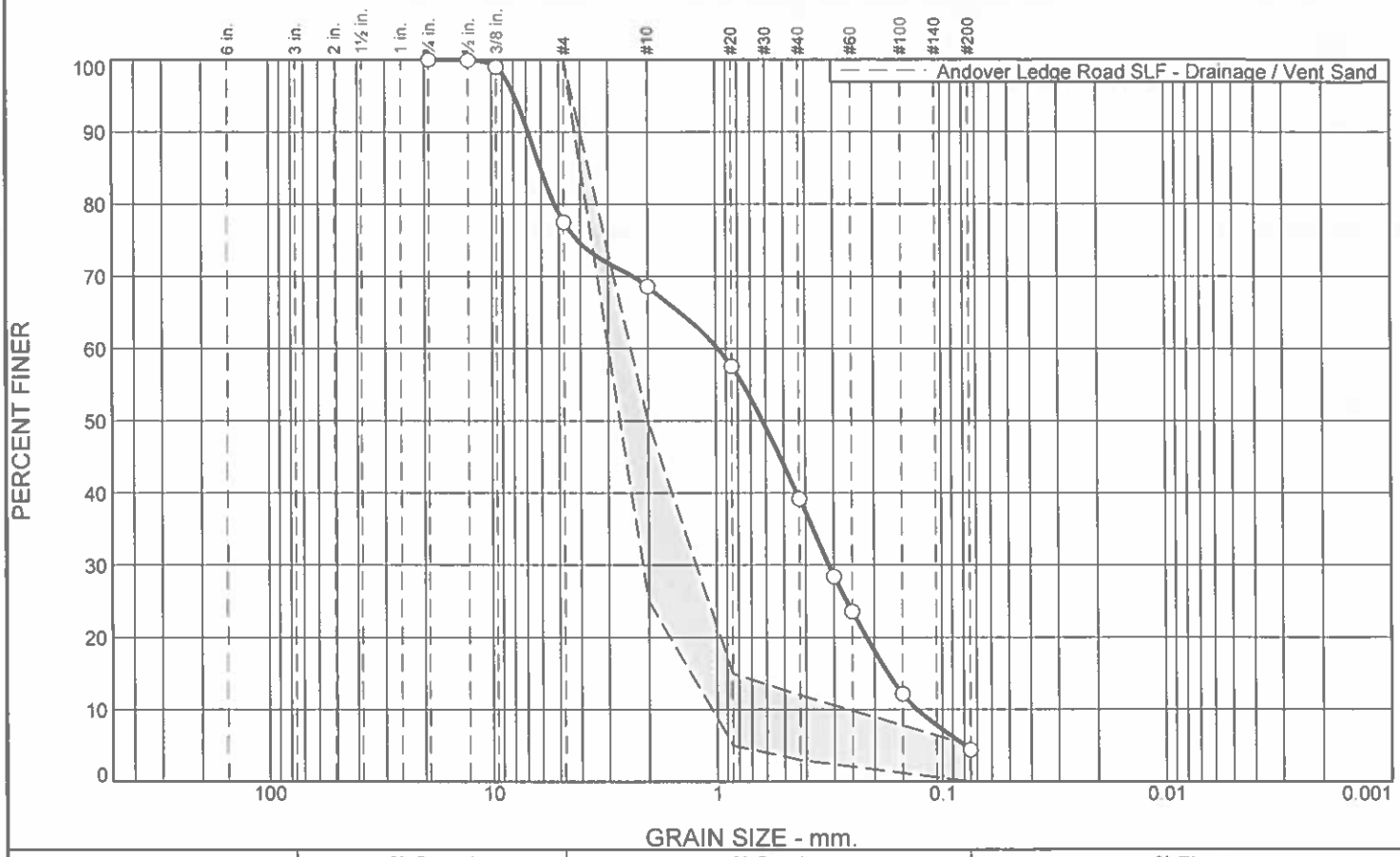
Sample No.: L-34886 **Source of Sample:** Andover SLF **Date:** 7/24/24
Location: Granular Fill (Sand) **Elev./Depth:** 4500cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	22.5	8.9	29.4	34.8	4.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	99.9		
3/8"	99.0		
#4	77.5	100	X
#10	68.6	25-50	X
#20	57.6	5-15	X
#40	39.2	3-12	X
#50	28.4		
#60	23.6		
#100	12.1		
#200	4.4	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan 3/4" max f/m sand some gravel trace silt
Proctor test not requested

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 6.0416 D_{60}= 0.9749 D_{50}= 0.6196
D_{30}= 0.3162 D_{15}= 0.1741 D_{10}= 0.1296
C_u= 7.52 C_c= 0.79

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample submitted by client on 07/18/24
Did not meet project "Coarse Sand" gradation limits

Sample No.: L-34887 **Source of Sample:** Andover SLF **Date:** 7/24/24
Location: Granular Fill (Sand) **Elev./Depth:** 6000cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

July 26, 2024

Mr. John Bates
J. Bates & Son, LLC
57 Lawrence Street
Clinton MA 01510

RE: Soil & Permeability Test Results
Andover Ledge Rd SLF
Andover, NH **Project # 26023**

Dear Mr. Bates:

Presented herein are the results of laboratory testing on a sample SP tan f/m sand some gravel trace silt (**#L-34887**), submitted on July 18, 2024. Testing consisted of a one-point constant head permeability test (ASTM D-2434).

The permeability specimen was then prepared by compacting a calculated quantity of soil into a 1/30 cubic foot rigid mold. The test conditions and result are summarized on the Table below:

 # L-34887 – Sand 6000 cy
USCS Soil Classification = SP tan f/m sand some gravel trace silt

Estimated Compaction (%)	Permeability (cm/sec)
90	4.4×10^{-2}

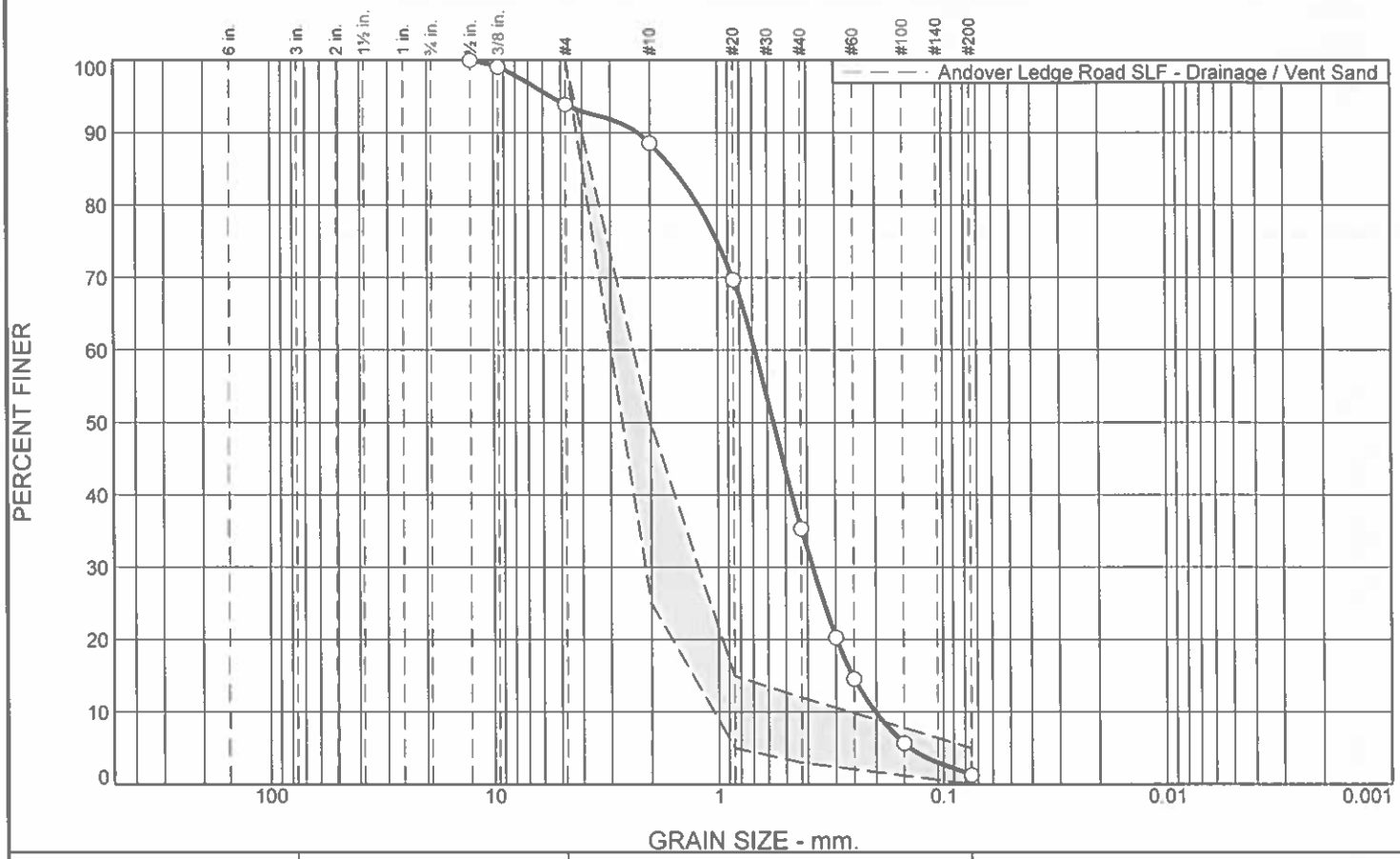
As can be seen above, the soil in question showed a permeability of 4.4×10^{-2} when compacted to approximately 90%, which met both "Coarse Gas Venting" layer specification of 1×10^{-3} cm/sec and "Drainage" layer specification 1.2×10^{-2} However, it should be noted that the permeability of cohesionless soils is inversely related to the degree of compaction but independent of the compacted moisture content.

Should you have any questions or wish to discuss the above soil test results or attached gradation ("sieve") curve, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	6.1	5.3	53.3	34.0	1.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	99.1		
#4	93.9	100	X
#10	88.6	25-50	X
#20	69.7	5-15	X
#40	35.3	3-12	X
#50	20.3		
#60	14.6		
#100	5.7		
#200	1.3	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace gravel ttrace sil
Proctor test not requested

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.5804 D_{60}= 0.6813 D_{50}= 0.5641
D_{30}= 0.3785 D_{15}= 0.2544 D_{10}= 0.2013
C_u= 3.39 C_c= 1.04

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample submitted by client on 07/25/24
Did not meet project "Coarse Sand" gradation limits

Sample No.: L-34922 **Source of Sample:** Andover SLF **Date:** 7/29/24
Location: Granular Fill (Sand) **Elev./Depth:** 7500cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

July 30, 2024

Mr. John Bates
J. Bates & Son, LLC
57 Lawrence Street
Clinton MA 01510

RE: Soil & Permeability Test Results
Andover Ledge Rd SLF
Andover, NH **Project # 26023**

Dear Mr. Bates:

Presented herein are the results of laboratory testing on a sample SP tan f/m sand trace gravel trace silt (**#L-34923**), submitted on July 25, 2024. Testing consisted of a one-point constant head permeability test (ASTM D-2434).

The permeability specimen was then prepared by compacting a calculated quantity of soil into a 1/30 cubic foot rigid mold. The test conditions and result are summarized on the Table below:

 # L-34923 – Sand 9000 cy
USCS Soil Classification = SP tan f/m sand trace gravel trace silt

Estimated Compaction (%)	Permeability (cm/sec)
90	2.6×10^{-2}

As can be seen above, the soil in question showed a permeability of 2.6×10^{-2} when compacted to approximately 90%, which met both "Coarse Gas Venting" layer specification of 1×10^{-3} cm/sec and "Drainage" layer specification 1.2×10^{-2} However, it should be noted that the permeability of cohesionless soils is inversely related to the degree of compaction but independent of the compacted moisture content.

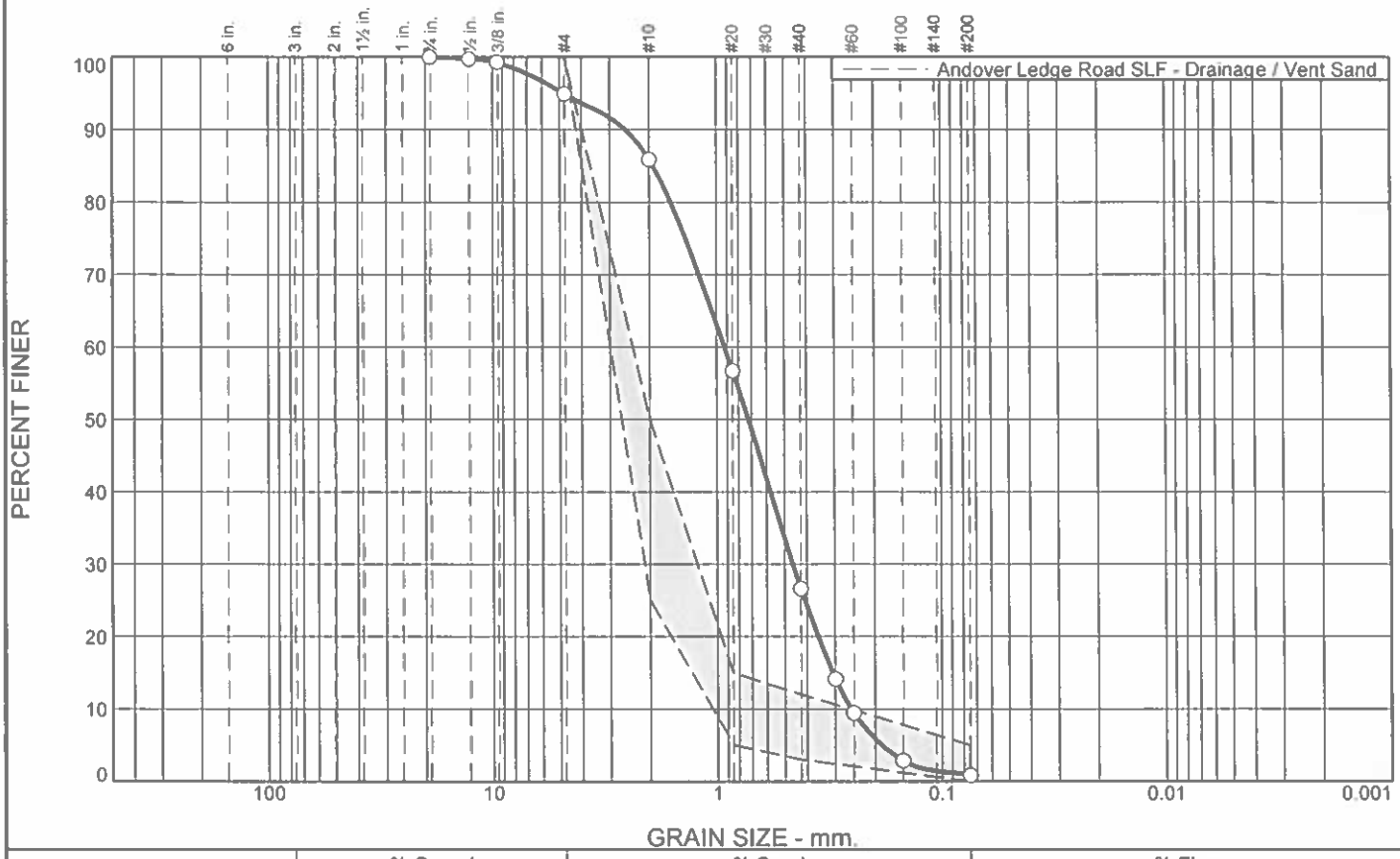
Should you have any questions or wish to discuss the above soil test results or attached gradation ("sieve") curve, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	5.1	9.0	59.3	25.8	0.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	99.8		
3/8"	99.3		
#4	94.9	100	X
#10	85.9	25-50	X
#20	56.7	5-15	X
#40	26.6	3-12	X
#50	14.2		
#60	9.5		
#100	2.9		
#200	0.8	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace gravel trace silt
D-1557 proctor = 116.3 pcf @ 10.6% optimum moisture

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.9248 D_{60}= 0.9256 D_{50}= 0.7230
D_{30}= 0.4614 D_{15}= 0.3082 D_{10}= 0.2567
C_u= 3.61 C_c= 0.90

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample submitted by client on 07/25/24
Did not meet project "Coarse Sand" gradation limits

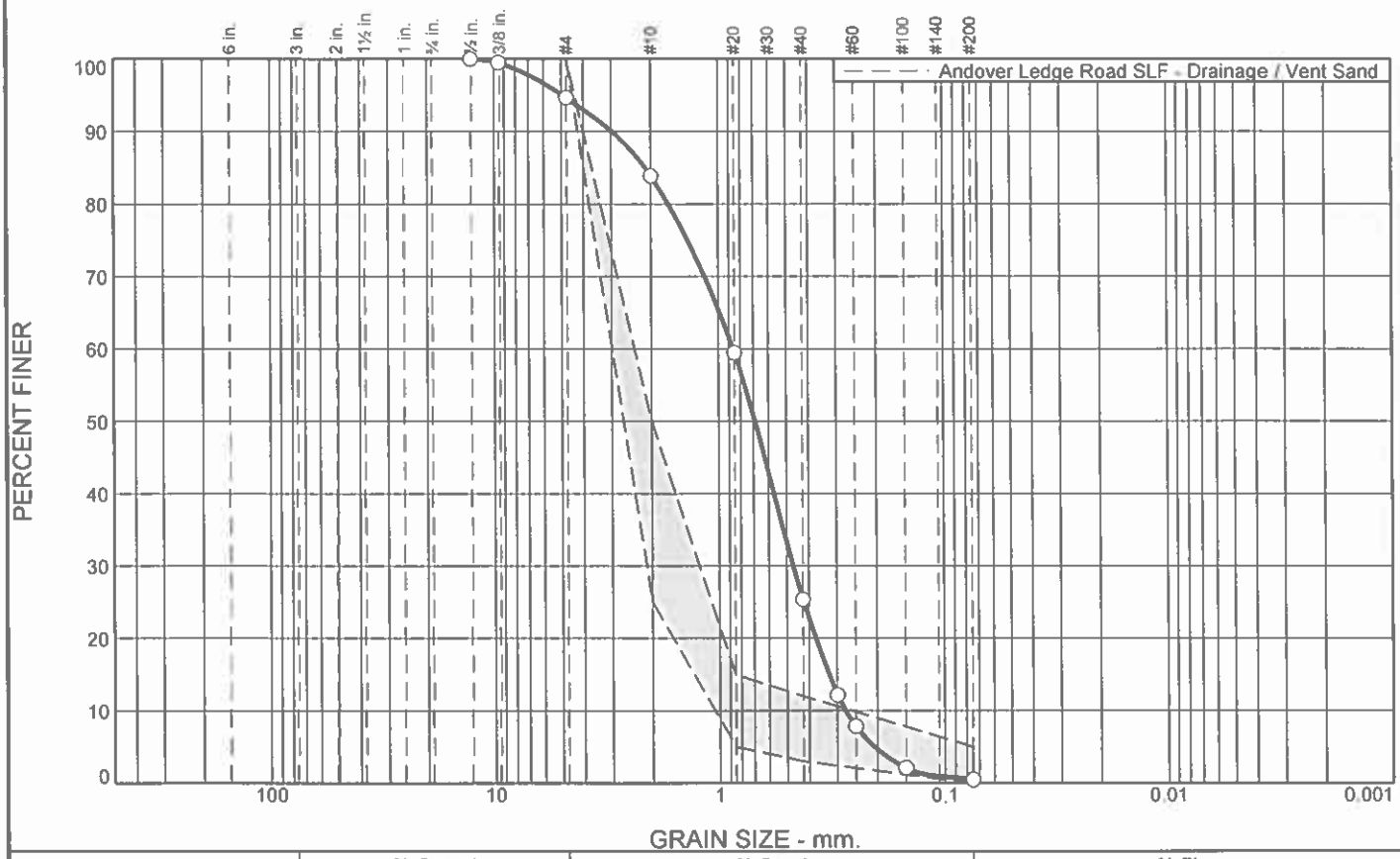
Sample No.: L-34923 **Source of Sample:** Andover SLF **Date:** 7/30/24
Location: Granular Fill (Sand) **Elev./Depth:** 9000cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	5.3	10.8	58.5	24.9	0.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	99.5		
#4	94.7	100	X
#10	83.9	25-50	X
#20	59.4	5-15	X
#40	25.4	3-12	X
#50	12.2		
#60	7.8		
#100	2.1		
#200	0.5	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace fine gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 2.1187 D_{60}= 0.8623 D_{50}= 0.6899
D_{30}= 0.4694 D_{15}= 0.3267 D_{10}= 0.2770
C_u= 3.11 C_c= 0.92

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample was submitted by client on 08/01/24
Did not meet project Coarse Sand gradation limits

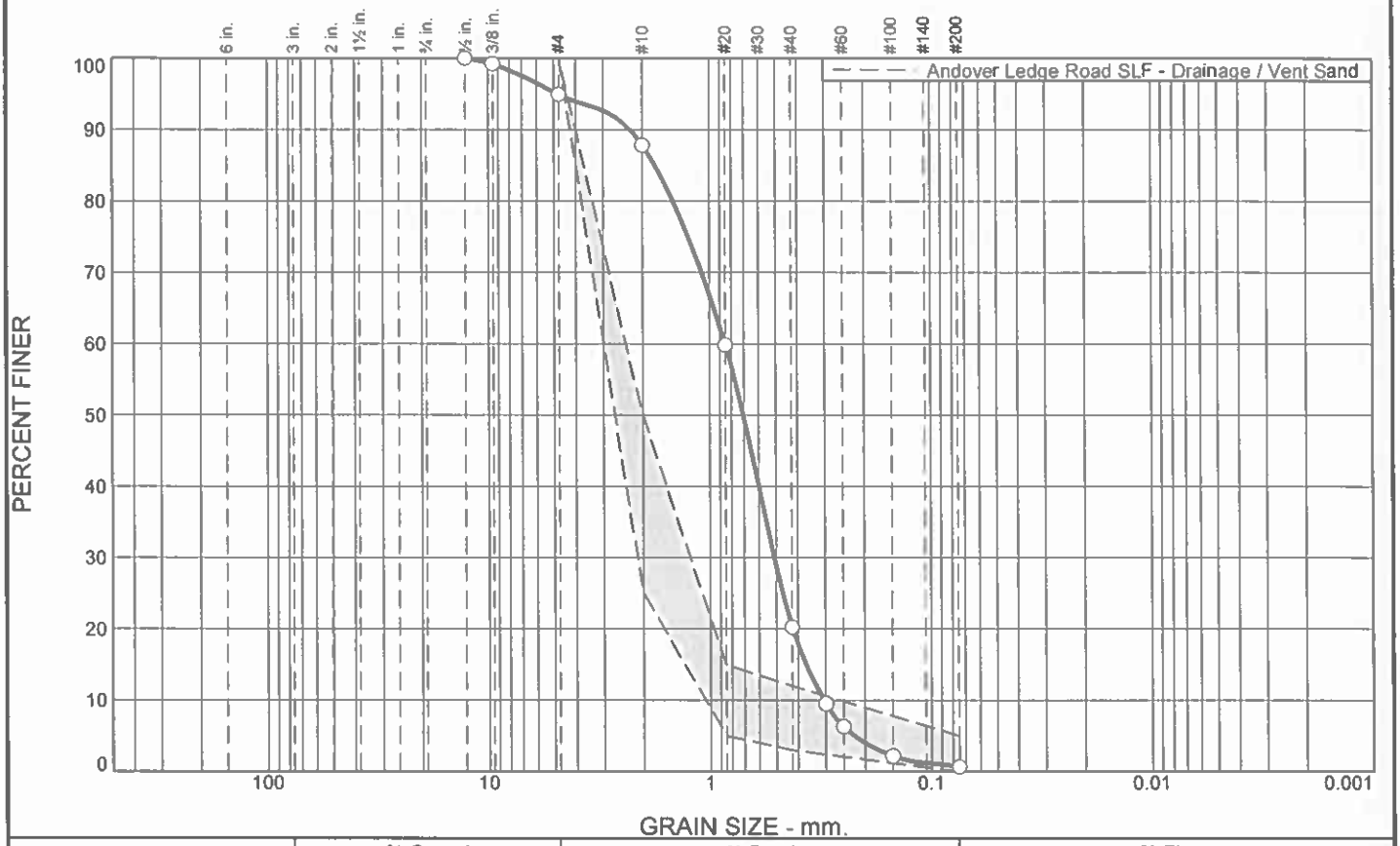
Sample No.: L34961 **Source of Sample:** Andover SLF **Date:** 8/6/24
Location: Coarse Sand **Elev./Depth:** 10500cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	5.1	7.0	67.6	19.6	0.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	99.2		
#4	94.9	100	X
#10	87.9	25-50	X
#20	59.8	5-15	X
#40	20.3	3-12	X
#50	9.5		
#60	6.3		
#100	2.2		
#200	0.7	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace fine gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.7600 D_{60}= 0.8529 D_{50}= 0.7061
D_{30}= 0.5115 D_{15}= 0.3684 D_{10}= 0.3057
C_u= 2.79 C_c= 1.00

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample was submitted by client 08/01/24
Did not meet project Coarse Sand gradation limits

Sample No.: L34962 **Source of Sample:** Andover SLF **Date:** 8/6/24
Location: Coarse Sand **Elev./Depth:** 12000

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

August 6, 2024

Mr. John Bates
J. Bates & Son, LLC
57 Lawrence Street
Clinton MA 01510

RE: Soil & Permeability Test Results
Andover Ledge Rd SLF
Andover, NH **Project # 26023**

Dear Mr. Bates:

Presented herein are the results of laboratory testing on a sample SP tan m/f sand trace gravel trace silt **(#L-34962)**, submitted on August 1, 2024. Testing consisted of a one-point constant head permeability test (ASTM D-2434).

The permeability specimen was then prepared by compacting a calculated quantity of soil into a 1/30 cubic foot rigid mold. The test conditions and result are summarized on the Table below:

 # L-34962 – Sand 12000 cy
USCS Soil Classification = SP tan m/f sand trace gravel trace silt

Estimated Compaction (%)	Permeability (cm/sec)
90	**1.4×10^{-2}**

As can be seen above, the soil in question showed a permeability of 1.4×10^{-2} when compacted to approximately 90%, which met both "Coarse Gas Venting" layer specification of 1×10^{-3} cm/sec and "Drainage" layer specification 1.2×10^{-2} However, it should be noted that the permeability of cohesionless soils is inversely related to the degree of compaction but independent of the compacted moisture content.

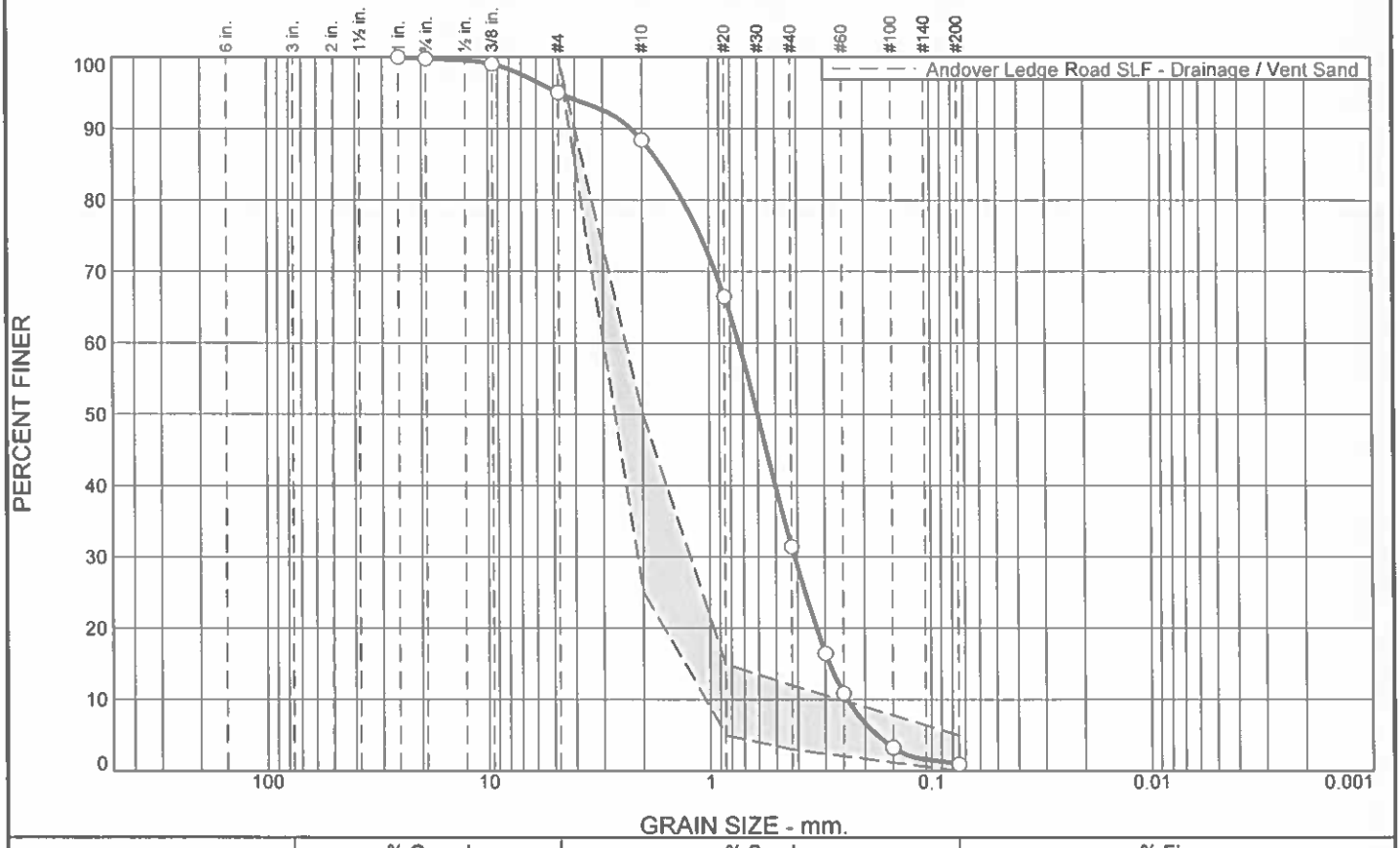
Should you have any questions or wish to discuss the above soil test results or attached gradation ("sieve") curve, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.2	4.7	6.7	57.0	30.5	0.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0		
3/4"	99.8		
3/8"	99.1		
#4	95.1	100	X
#10	88.4	25-50	X
#20	66.5	5-15	X
#40	31.4	3-12	X
#50	16.5		
#60	10.9		
#100	3.3		
#200	0.9	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.6547 D_{60}= 0.7324 D_{50}= 0.6042
D_{30}= 0.4120 D_{15}= 0.2879 D_{10}= 0.2403
C_u= 3.05 C_c= 0.96

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample submitted by client 8/12/24
Did not meet project sand gradation limits

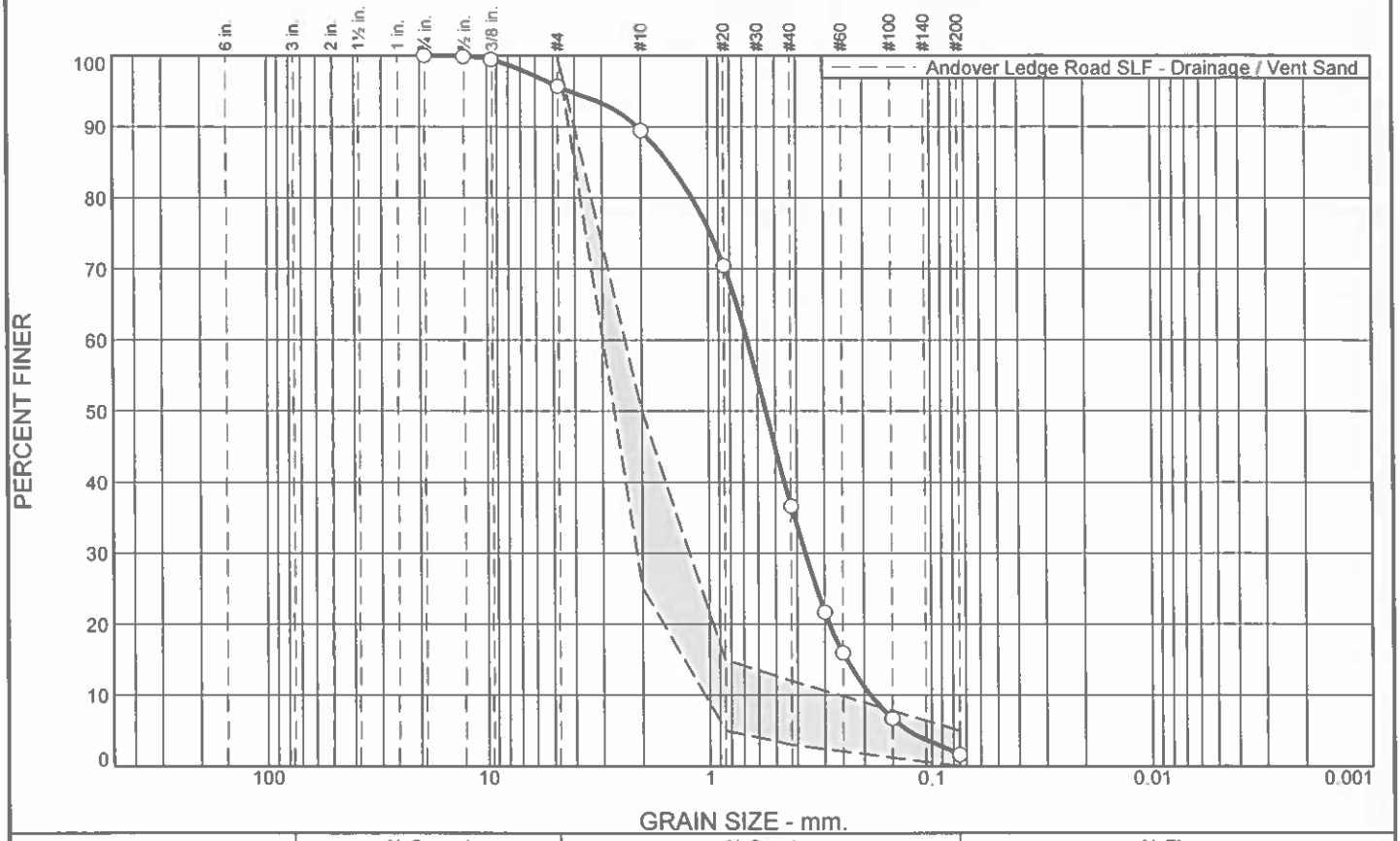
Sample No.: L35021 **Source of Sample:** Andover SLF **Date:** 8/15/24
Location: Coarse Sand **Elev./Depth:** 13500cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	4.3	6.3	52.8	35.0	1.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	99.9		
3/8"	99.4		
#4	95.7	100	X
#10	89.4	25-50	X
#20	70.4	5-15	X
#40	36.6	3-12	X
#50	21.7		
#60	15.9		
#100	6.7		
#200	1.6	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace gravel trace silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.5116 D_{60}= 0.6696 D_{50}= 0.5533
D_{30}= 0.3674 D_{15}= 0.2404 D_{10}= 0.1874
C_u= 3.57 C_c= 1.08

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample submitted by client 8/12/24
Did not meet project sand gradation limits

Sample No.: L35022 **Source of Sample:** Andover SLF **Date:** 8/15/24
Location: Coarse Sand **Elev./Depth:** 15000cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

August 15, 2024

Mr. John Bates
J. Bates & Son, LLC
57 Lawrence Street
Clinton MA 01510

RE: Soil & Permeability Test Results
Andover Ledge Rd SLF
Andover, NH **Project # 26023**

Dear Mr. Bates:

Presented herein are the results of laboratory testing on a sample SP tan m/f sand trace gravel trace silt (**#L-35022**), submitted on August 12, 2024. Testing consisted of a one-point constant head permeability test (ASTM D-2434).

The permeability specimen was then prepared by compacting a calculated quantity of soil into a 1/30 cubic foot rigid mold. The test conditions and result are summarized on the Table below:

 # L-35022 – Sand 15000 cy
USCS Soil Classification = SP tan m/f sand trace gravel trace silt

Estimated Compaction (%)	Permeability (cm/sec)
90	**1.8×10^{-2}**

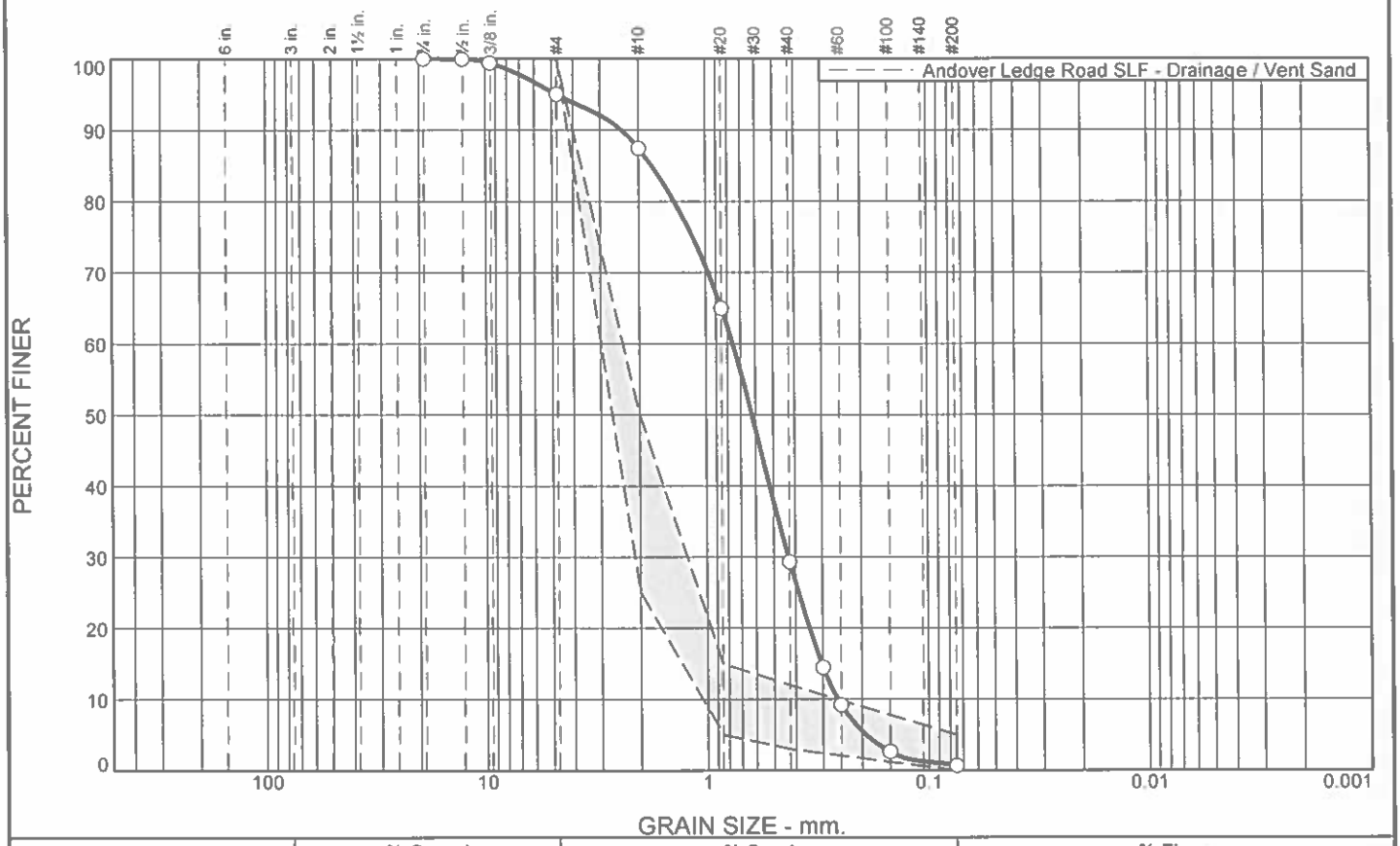
As can be seen above, the soil in question showed a permeability of 1.8×10^{-2} when compacted to approximately 90%, which met both "Coarse Gas Venting" layer specification of 1×10^{-3} cm/sec and "Drainage" layer specification 1.2×10^{-2} However, it should be noted that the permeability of cohesionless soils is inversely related to the degree of compaction but independent of the compacted moisture content.

Should you have any questions or wish to discuss the above soil test results or attached gradation ("sieve") curve, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	4.9	7.6	58.1	28.7	0.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	100.0		
3/8"	99.5		
#4	95.1	100	X
#10	87.5	25-50	X
#20	65.0	5-15	X
#40	29.4	3-12	X
#50	14.5		
#60	9.2		
#100	2.6		
#200	0.7	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace gravel trace silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.7489 D_{60}= 0.7576 D_{50}= 0.6245
D_{30}= 0.4308 D_{15}= 0.3043 D_{10}= 0.2589
C_u= 2.93 C_c= 0.95

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample submitted by client 8/12/24
Did not meet project sand gradation limits

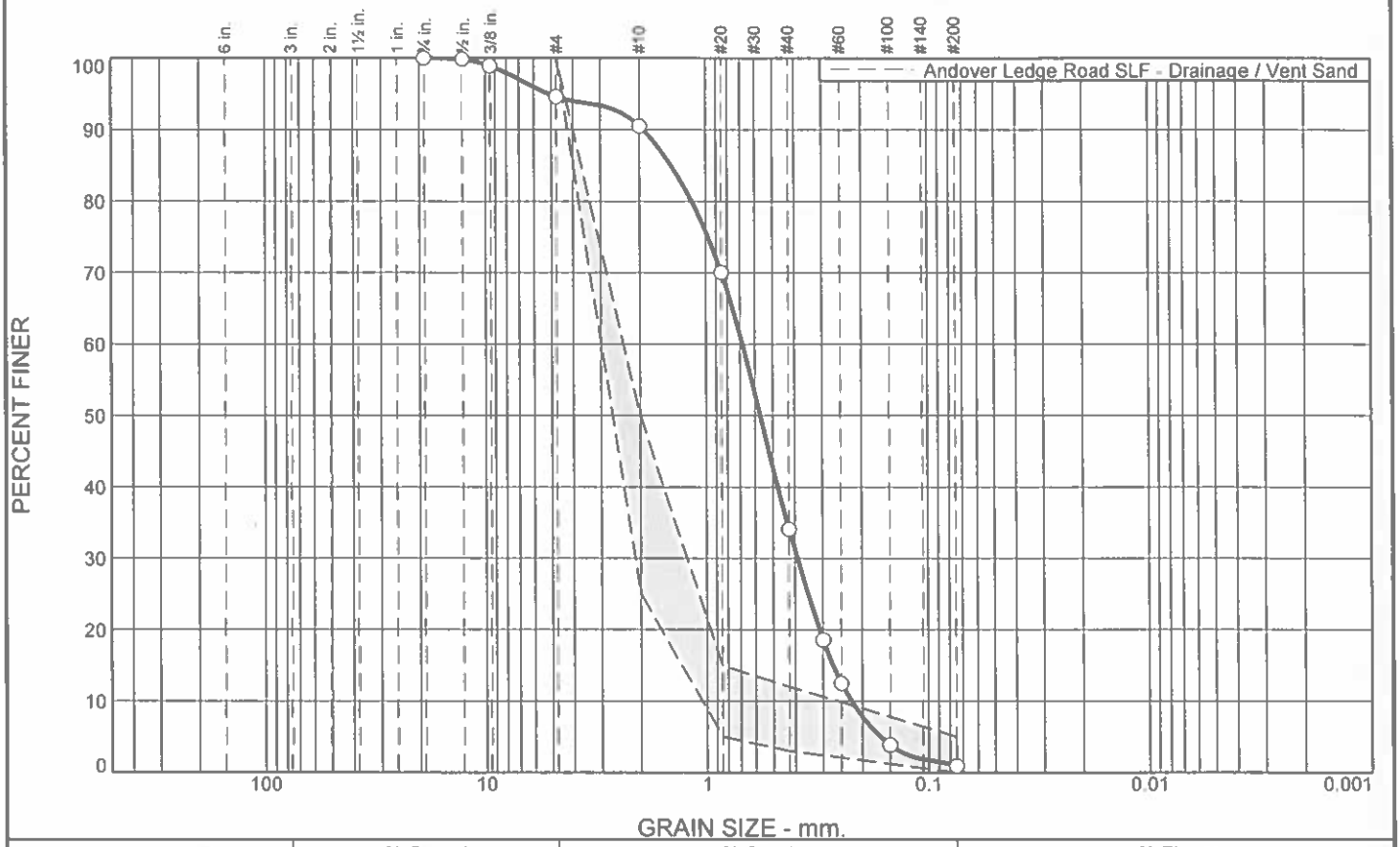
Sample No.: L35023 **Source of Sample:** Andover SLF **Date:** 8/15/24
Location: Coarse Sand **Elev./Depth:** 16500cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	5.4	4.1	56.4	33.2	0.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	99.9		
3/8"	98.9		
#4	94.6	100	X
#10	90.5	25-50	X
#20	70.0	5-15	X
#40	34.1	3-12	X
#50	18.6		
#60	12.5		
#100	3.9		
#200	0.9	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace gravel trace silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.4344 D_{60}= 0.6836 D_{50}= 0.5705
D_{30}= 0.3902 D_{15}= 0.2720 D_{10}= 0.2244
C_u= 3.05 C_c= 0.99

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample submitted by client 8/12/24
Did not meet project sand gradation limits

Sample No.: L35024 **Source of Sample:** Andover SLF **Date:** 8/15/24
Location: Coarse Sand **Elev./Depth:** 18000cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

August 19, 2024

Mr. John Bates
J. Bates & Son, LLC
57 Lawrence Street
Clinton MA 01510

RE: Soil & Permeability Test Results
Andover Ledge Rd SLF
Andover, NH **Project # 26023**

Dear Mr. Bates:

Presented herein are the results of laboratory testing on a sample SP tan m/f sand trace gravel trace silt **(#L-35023)**, submitted on August 12, 2024. Testing consisted of a one-point constant head permeability test (ASTM D-2434).

The permeability specimen was then prepared by compacting a calculated quantity of soil into a 1/30 cubic foot rigid mold. The test conditions and result are summarized on the Table below:

 # L-35023 – Sand 18000 cy
USCS Soil Classification = SP tan m/f sand trace gravel trace silt

Estimated Compaction (%)	Permeability (cm/sec)
90	**2.7×10^{-2}**

As can be seen above, the soil in question showed a permeability of 2.7×10^{-2} when compacted to approximately 90%, which met both "Coarse Gas Venting" layer specification of 1×10^{-3} cm/sec and "Drainage" layer specification 1.2×10^{-2} However, it should be noted that the permeability of cohesionless soils is inversely related to the degree of compaction but independent of the compacted moisture content.

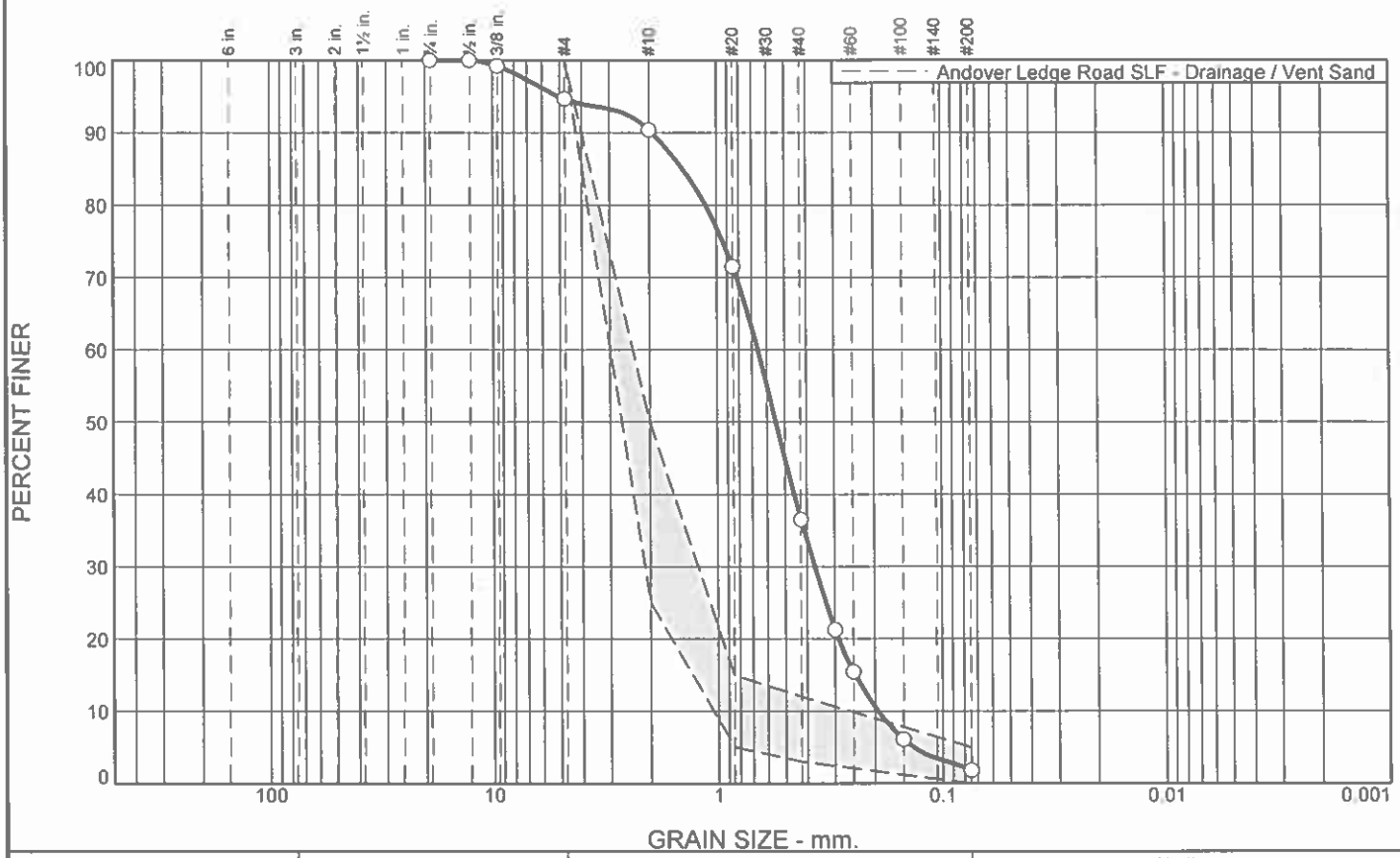
Should you have any questions or wish to discuss the above soil test results or attached gradation ("sieve") curve, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	5.3	4.3	53.9	34.7	1.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	100.0		
3/8"	99.2		
#4	94.7	100	X
#10	90.4	25-50	X
#20	71.5	5-15	X
#40	36.5	3-12	X
#50	21.3		
#60	15.5		
#100	6.1		
#200	1.8	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace gravel trace silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.4155 D_{60}= 0.6601 D_{50}= 0.5495
D_{30}= 0.3692 D_{15}= 0.2451 D_{10}= 0.1938
C_u= 3.41 C_c= 1.07

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample submitted by client 8/23/24
Did not meet project sand gradation limits

Sample No.: L35078 **Source of Sample:** Andover SLF **Date:** 8/26/24
Location: Coarse Sand **Elev./Depth:** 19500cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

August 30, 2024

Mr. John Bates
J. Bates & Son, LLC
57 Lawrence Street
Clinton MA 01510

RE: Soil & Permeability Test Results
Andover Ledge Rd SLF
Andover, NH **Project # 26023**

Dear Mr. Bates:

Presented herein are the results of laboratory testing on a sample SP tan m/f sand trace gravel trace silt **(#L-35079)**, submitted on August 23, 2024. Testing consisted of a one-point constant head permeability test (ASTM D-2434).

The permeability specimen was then prepared by compacting a calculated quantity of soil into a 1/30 cubic foot rigid mold. The test conditions and result are summarized on the Table below:

 # L-35079 – Sand 21000 cy
USCS Soil Classification = SP tan m/f sand trace gravel trace silt

Estimated Compaction (%)	Permeability (cm/sec)
90	**3.5×10^{-2}**

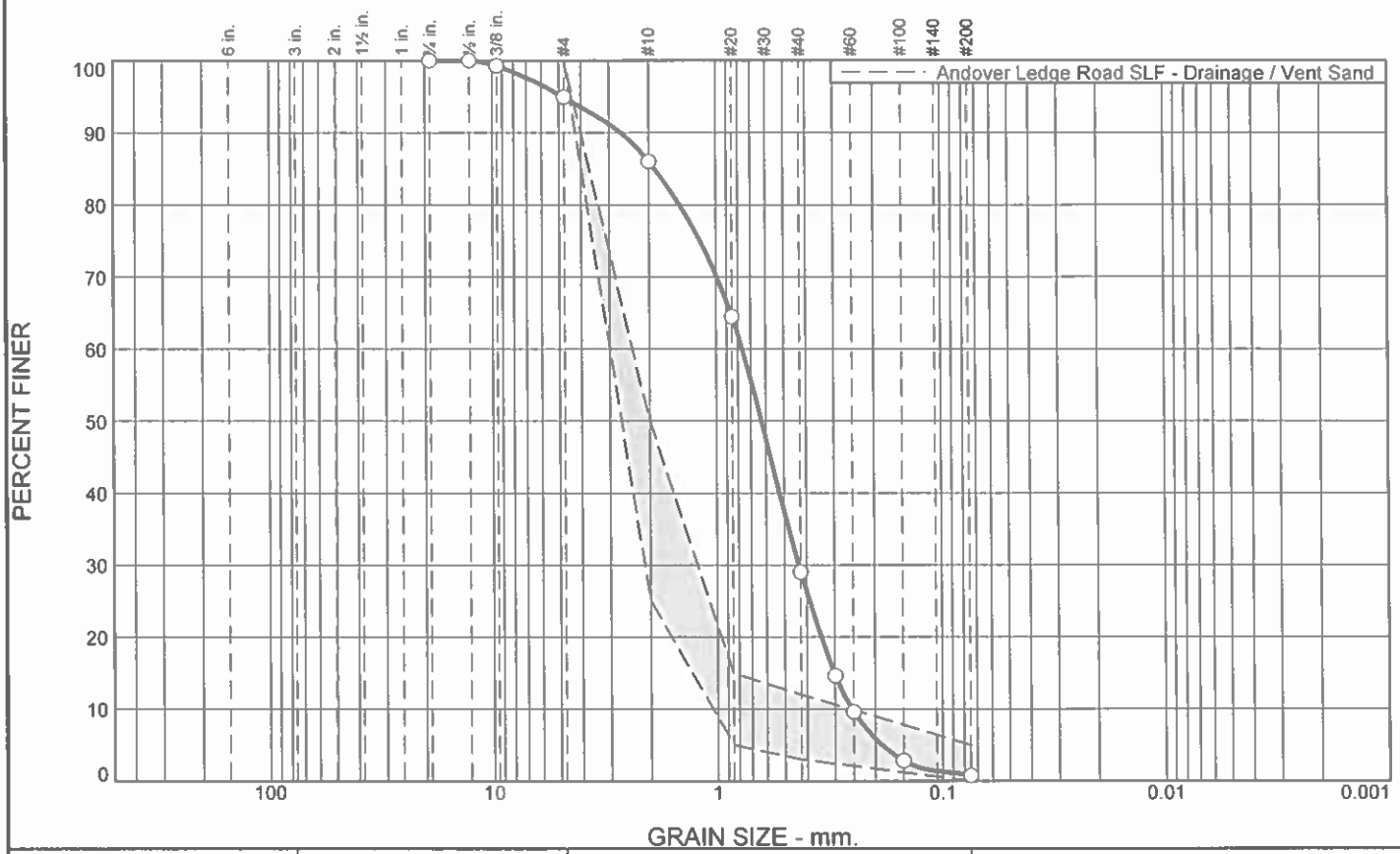
As can be seen above, the soil in question showed a permeability of 3.5×10^{-2} when compacted to approximately 90%, which met both "Coarse Gas Venting" layer specification of 1×10^{-3} cm/sec and "Drainage" layer specification 1.2×10^{-2} However, it should be noted that the permeability of cohesionless soils is inversely related to the degree of compaction but independent of the compacted moisture content.

Should you have any questions or wish to discuss the above soil test results or attached gradation ("sieve") curve, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	5.1	8.9	57.0	28.2	0.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	100.0		
3/8"	99.3		
#4	94.9	100	X
#10	86.0	25-50	X
#20	64.5	5-15	X
#40	29.0	3-12	X
#50	14.7		
#60	9.6		
#100	2.8		
#200	0.8	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace gravel trace silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.8888 D_{60}= 0.7644 D_{50}= 0.6291
D_{30}= 0.4338 D_{15}= 0.3029 D_{10}= 0.2544
C_u= 3.00 C_c= 0.97

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample submitted by client 8/23/24
Did not meet project sand gradation limits

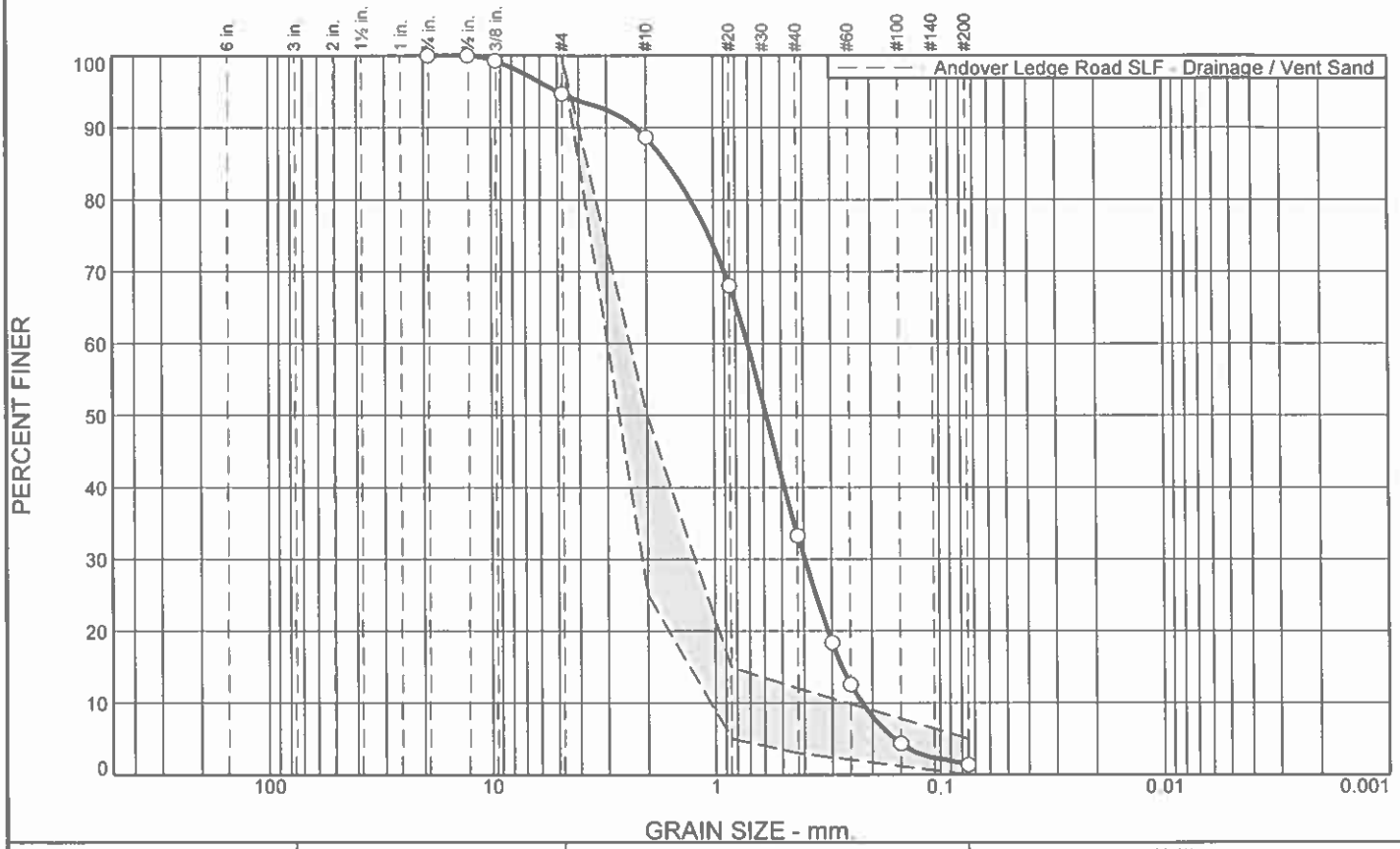
Sample No.: L35079 **Source of Sample:** Andover SLF **Date:** 8/26/24
Location: Coarse Sand **Elev./Depth:** 21000cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	5.3	6.0	55.4	31.9	1.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	100.0		
3/8"	99.3		
#4	94.7	100	X
#10	88.7	25-50	X
#20	68.0	5-15	X
#40	33.3	3-12	X
#50	18.4		
#60	12.6		
#100	4.3		
#200	1.4	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace gravel trace silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.6091 D_{60}= 0.7078 D_{50}= 0.5852
D_{30}= 0.3957 D_{15}= 0.2723 D_{10}= 0.2221
C_u= 3.19 C_c= 1.00

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample submitted by client 8/23/24
Did not meet project sand gradation limits

Sample No.: L35080 **Source of Sample:** Andover SLF **Date:** 8/26/24
Location: Coarse Sand **Elev./Depth:** 22500cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

August 30, 2024

Mr. John Bates
J. Bates & Son, LLC
57 Lawrence Street
Clinton MA 01510

RE: Soil & Permeability Test Results
Andover Ledge Rd SLF
Andover, NH **Project # 26023**

Dear Mr. Bates:

Presented herein are the results of laboratory testing on a sample SP tan m/f sand trace gravel trace silt (**#L-35081**), submitted on August 23, 2024. Testing consisted of a one-point constant head permeability test (ASTM D-2434).

The permeability specimen was then prepared by compacting a calculated quantity of soil into a 1/30 cubic foot rigid mold. The test conditions and result are summarized on the Table below:

 # L-35081 – Sand 24000 cy
USCS Soil Classification = SP tan m/f sand trace gravel trace silt

Estimated Compaction (%)	Permeability (cm/sec)
90	**1.9×10^{-2}**

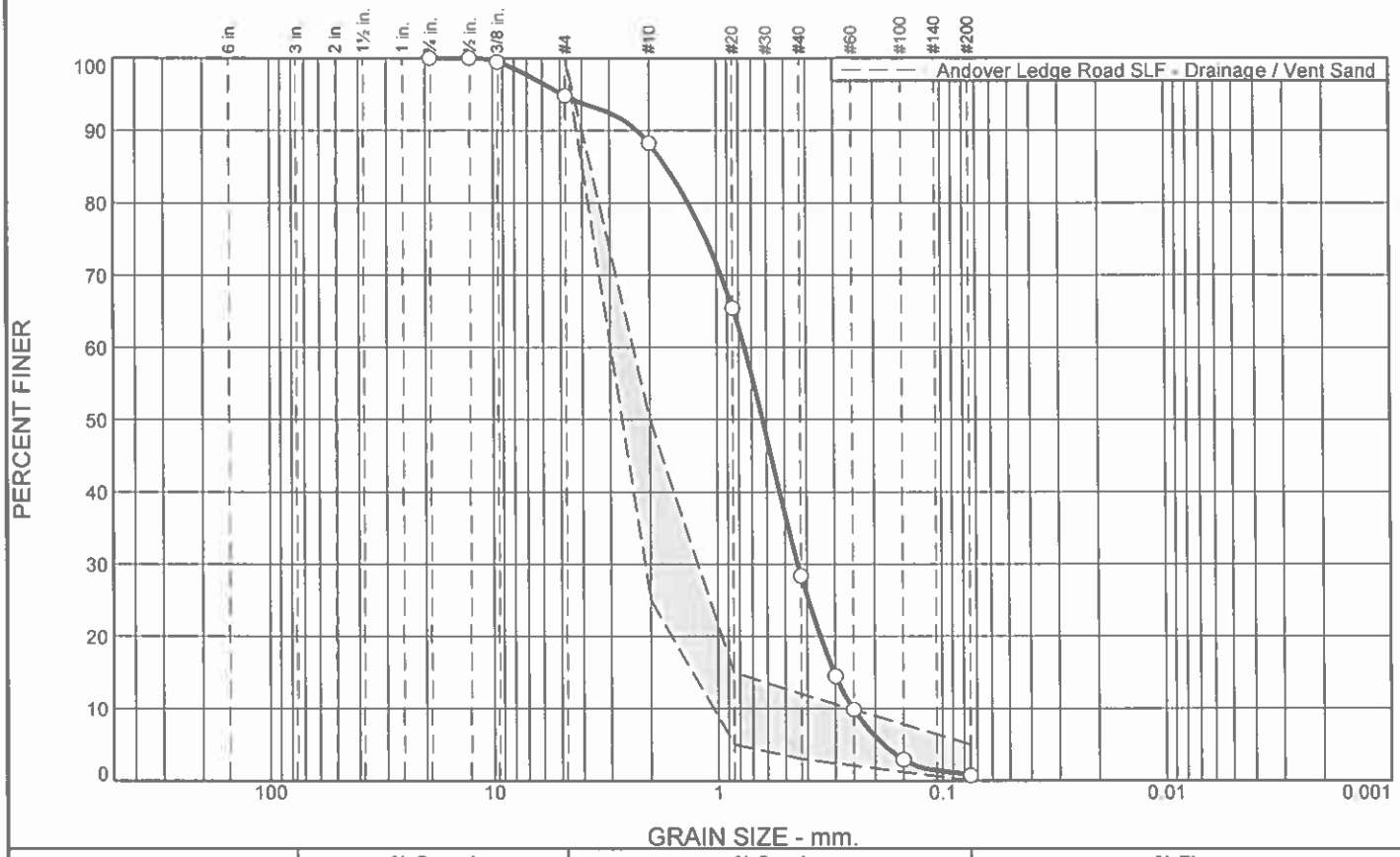
As can be seen above, the soil in question showed a permeability of 1.9×10^{-2} when compacted to approximately 90%, which met both "Coarse Gas Venting" layer specification of 1×10^{-3} cm/sec and "Drainage" layer specification 1.2×10^{-2} However, it should be noted that the permeability of cohesionless soils is inversely related to the degree of compaction but independent of the compacted moisture content.

Should you have any questions or wish to discuss the above soil test results or attached gradation ("sieve") curve, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	5.2	6.6	59.8	27.7	0.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	100.0		
3/8"	99.5		
#4	94.8	100	X
#10	88.2	25-50	X
#20	65.4	5-15	X
#40	28.4	3-12	X
#50	14.5		
#60	9.9		
#100	2.9		
#200	0.7	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace gravel trace silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.6788 D_{60}= 0.7538 D_{50}= 0.6276
D_{30}= 0.4396 D_{15}= 0.3048 D_{10}= 0.2519
C_u= 2.99 C_c= 1.02

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample submitted by client 8/23/24
Did not meet project sand gradation limits

Sample No.: L35081 **Source of Sample:** Andover SLF **Date:** 8/26/24
Location: Coarse Sand **Elev./Depth:** 24000cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

ANALYTICAL REPORT

Lab Number:	L2451680
Client:	J. Bates & Son, LLC P.O Box 997 Clinton, MA 01510
ATTN:	Seth Mcnally
Phone:	(978) 368-7001
Project Name:	ANDOVER LANDFILL
Project Number:	Not Specified
Report Date:	09/18/24

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930A1).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: ANDOVER LANDFILL
Project Number: Not Specified

Lab Number: L2451680
Report Date: 09/18/24

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2451680-01	SAND 5,000 C4	SOIL	ANDOVER, MA	09/10/24 07:10	09/10/24
L2451680-02	SAND 10,000 C4	SOIL	ANDOVER, MA	09/10/24 07:15	09/10/24
L2451680-03	SAND 15,000 C4	SOIL	ANDOVER, MA	09/10/24 07:20	09/10/24
L2451680-04	SAND 20,000 C4	SOIL	ANDOVER, MA	09/10/24 07:25	09/10/24
L2451680-05	SAND 25,000 C4	SOIL	ANDOVER, MA	09/10/24 07:30	09/10/24

Project Name:	ANDOVER LANDFILL	**Lab Number:**	L2451680
Project Number:	Not Specified	**Report Date:**	09/18/24

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	NO

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	ANDOVER LANDFILL	**Lab Number:**	L2451680
Project Number:	Not Specified	**Report Date:**	09/18/24

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments and solids are reported on a dry weight basis unless otherwise noted. Tissues are reported "as received" or on a wet weight basis, unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name:	ANDOVER LANDFILL	**Lab Number:**	L2451680
Project Number:	Not Specified	**Report Date:**	09/18/24

Case Narrative (continued)

MCP Related Narratives

Sample Receipt

In reference to quest

The analyses performed were specified by the client.

In reference to question H:

A Matrix Spike was not submitted for the analysis of Total Metals.

PAHs

In reference to question I:

All samples were analyzed for a subset of MCP analytes per client request.

Total Metals

In reference to question I:

All samples were analyzed for a subset of MCP analytes per client request.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Cristin Walker

Title: Technical Director/Representative Date: 09/18/24

QC OUTLIER SUMMARY REPORT

Project Name: ANDOVER LANDFILL
Project Number: Not Specified

Lab Number: L2451680
Report Date: 09/18/24

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment

There are no QC Outliers associated with this report.

ORGANICS

SEMIVOLATILES

Project Name: ANDOVER LANDFILL
Project Number: Not Specified
Lab Number: L2451680
Report Date: 09/18/24

SAMPLE RESULTS

Lab ID: L2451680-01
Client ID: SAND 5,000 C4
Sample Location: ANDOVER, MA

Date Collected: 09/10/24 07:10
Date Received: 09/10/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8270E
Analytical Date: 09/15/24 22:35
Analyst: SMZ
Percent Solids: 100%

Extraction Method: EPA 3546
Extraction Date: 09/14/24 19:55

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP PAHs - Westborough Lab						
Acenaphthene	ND		ug/kg	130	--	1
Fluoranthene	ND		ug/kg	98	--	1
Naphthalene	ND		ug/kg	160	--	1
Benzo(a)anthracene	ND		ug/kg	98	--	1
Benzo(a)pyrene	ND		ug/kg	130	--	1
Benzo(b)fluoranthene	ND		ug/kg	98	--	1
Benzo(k)fluoranthene	ND		ug/kg	98	--	1
Chrysene	ND		ug/kg	98	--	1
Acenaphthylene	ND		ug/kg	130	--	1
Anthracene	ND		ug/kg	98	--	1
Benzo(ghi)perylene	ND		ug/kg	130	--	1
Fluorene	ND		ug/kg	160	--	1
Phenanthrene	ND		ug/kg	98	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	68	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	130	--	1
Pyrene	ND		ug/kg	98	--	1
2-Methylnaphthalene	ND		ug/kg	68	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	74		30-130
2-Fluorobiphenyl	69		30-130
4-Terphenyl-d14	82		30-130

Project Name: ANDOVER LANDFILL
Project Number: Not Specified
Lab Number: L2451680
Report Date: 09/18/24

SAMPLE RESULTS

Lab ID: L2451680-02
Client ID: SAND 10,000 C4
Sample Location: ANDOVER, MA

Date Collected: 09/10/24 07:15
Date Received: 09/10/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8270E
Analytical Date: 09/16/24 00:58
Analyst: SMZ
Percent Solids: 100%

Extraction Method: EPA 3546
Extraction Date: 09/14/24 19:55

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP PAHs - Westborough Lab						
Acenaphthene	ND		ug/kg	130	--	1
Fluoranthene	ND		ug/kg	99	--	1
Naphthalene	ND		ug/kg	160	--	1
Benzo(a)anthracene	ND		ug/kg	99	--	1
Benzo(a)pyrene	ND		ug/kg	130	--	1
Benzo(b)fluoranthene	ND		ug/kg	99	--	1
Benzo(k)fluoranthene	ND		ug/kg	99	--	1
Chrysene	ND		ug/kg	99	--	1
Acenaphthylene	ND		ug/kg	130	--	1
Anthracene	ND		ug/kg	99	--	1
Benzo(ghi)perylene	ND		ug/kg	130	--	1
Fluorene	ND		ug/kg	160	--	1
Phenanthrene	ND		ug/kg	99	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	69	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	130	--	1
Pyrene	ND		ug/kg	99	--	1
2-Methylnaphthalene	ND		ug/kg	69	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	69		30-130
2-Fluorobiphenyl	66		30-130
4-Terphenyl-d14	77		30-130

Project Name: ANDOVER LANDFILL
Project Number: Not Specified
Lab Number: L2451680
Report Date: 09/18/24

SAMPLE RESULTS

Lab ID: L2451680-03
Client ID: SAND 15,000 C4
Sample Location: ANDOVER, MA

Date Collected: 09/10/24 07:20
Date Received: 09/10/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8270E
Analytical Date: 09/15/24 23:23
Analyst: SMZ
Percent Solids: 100%

Extraction Method: EPA 3546
Extraction Date: 09/14/24 19:55

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP PAHs - Westborough Lab						
Acenaphthene	ND		ug/kg	130	--	1
Fluoranthene	ND		ug/kg	100	--	1
Naphthalene	ND		ug/kg	170	--	1
Benzo(a)anthracene	ND		ug/kg	100	--	1
Benzo(a)pyrene	ND		ug/kg	130	--	1
Benzo(b)fluoranthene	ND		ug/kg	100	--	1
Benzo(k)fluoranthene	ND		ug/kg	100	--	1
Chrysene	ND		ug/kg	100	--	1
Acenaphthylene	ND		ug/kg	130	--	1
Anthracene	ND		ug/kg	100	--	1
Benzo(ghi)perylene	ND		ug/kg	130	--	1
Fluorene	ND		ug/kg	170	--	1
Phenanthrene	ND		ug/kg	100	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	70	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	130	--	1
Pyrene	ND		ug/kg	100	--	1
2-Methylnaphthalene	ND		ug/kg	70	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	69		30-130
2-Fluorobiphenyl	64		30-130
4-Terphenyl-d14	78		30-130

Project Name: ANDOVER LANDFILL
Project Number: Not Specified
Lab Number: L2451680
Report Date: 09/18/24

SAMPLE RESULTS

Lab ID: L2451680-04
Client ID: SAND 20,000 C4
Sample Location: ANDOVER, MA

Date Collected: 09/10/24 07:25
Date Received: 09/10/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8270E
Analytical Date: 09/16/24 02:09
Analyst: SMZ
Percent Solids: 100%

Extraction Method: EPA 3546
Extraction Date: 09/14/24 19:55

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP PAHs - Westborough Lab						
Acenaphthene	ND		ug/kg	130	--	1
Fluoranthene	ND		ug/kg	100	--	1
Naphthalene	ND		ug/kg	160	--	1
Benzo(a)anthracene	ND		ug/kg	100	--	1
Benzo(a)pyrene	ND		ug/kg	130	--	1
Benzo(b)fluoranthene	ND		ug/kg	100	--	1
Benzo(k)fluoranthene	ND		ug/kg	100	--	1
Chrysene	ND		ug/kg	100	--	1
Acenaphthylene	ND		ug/kg	130	--	1
Anthracene	ND		ug/kg	100	--	1
Benzo(ghi)perylene	ND		ug/kg	130	--	1
Fluorene	ND		ug/kg	160	--	1
Phenanthrene	ND		ug/kg	100	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	70	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	130	--	1
Pyrene	ND		ug/kg	100	--	1
2-Methylnaphthalene	ND		ug/kg	70	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	68		30-130
2-Fluorobiphenyl	63		30-130
4-Terphenyl-d14	75		30-130

Project Name: ANDOVER LANDFILL
Project Number: Not Specified
Lab Number: L2451680
Report Date: 09/18/24

SAMPLE RESULTS

Lab ID: L2451680-05
Client ID: SAND 25,000 C4
Sample Location: ANDOVER, MA

Date Collected: 09/10/24 07:30
Date Received: 09/10/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8270E
Analytical Date: 09/16/24 01:22
Analyst: SMZ
Percent Solids: 100%

Extraction Method: EPA 3546
Extraction Date: 09/14/24 19:55

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP PAHs - Westborough Lab						
Acenaphthene	ND		ug/kg	130	--	1
Fluoranthene	ND		ug/kg	99	--	1
Naphthalene	ND		ug/kg	160	--	1
Benzo(a)anthracene	ND		ug/kg	99	--	1
Benzo(a)pyrene	ND		ug/kg	130	--	1
Benzo(b)fluoranthene	ND		ug/kg	99	--	1
Benzo(k)fluoranthene	ND		ug/kg	99	--	1
Chrysene	ND		ug/kg	99	--	1
Acenaphthylene	ND		ug/kg	130	--	1
Anthracene	ND		ug/kg	99	--	1
Benzo(ghi)perylene	ND		ug/kg	130	--	1
Fluorene	ND		ug/kg	160	--	1
Phenanthrene	ND		ug/kg	99	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	69	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	130	--	1
Pyrene	ND		ug/kg	99	--	1
2-Methylnaphthalene	ND		ug/kg	69	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	73		30-130
2-Fluorobiphenyl	71		30-130
4-Terphenyl-d14	81		30-130

Project Name: ANDOVER LANDFILL
Project Number: Not Specified
Lab Number: L2451680
Report Date: 09/18/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E
Analytical Date: 09/15/24 20:12
Analyst: SMZ

Extraction Method: EPA 3546
Extraction Date: 09/14/24 17:40

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-05 Batch: WG1971743-1					
Acenaphthene	ND		ug/kg	130	--
Fluoranthene	ND		ug/kg	97	--
Naphthalene	ND		ug/kg	160	--
Benzo(a)anthracene	ND		ug/kg	97	--
Benzo(a)pyrene	ND		ug/kg	130	--
Benzo(b)fluoranthene	ND		ug/kg	97	--
Benzo(k)fluoranthene	ND		ug/kg	97	--
Chrysene	ND		ug/kg	97	--
Acenaphthylene	ND		ug/kg	130	--
Anthracene	ND		ug/kg	97	--
Benzo(ghi)perylene	ND		ug/kg	130	--
Fluorene	ND		ug/kg	160	--
Phenanthrene	ND		ug/kg	97	--
Dibenzo(a,h)anthracene	ND		ug/kg	68	--
Indeno(1,2,3-cd)pyrene	ND		ug/kg	130	--
Pyrene	ND		ug/kg	97	--
2-Methylnaphthalene	ND		ug/kg	68	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Nitrobenzene-d5	79		30-130
2-Fluorobiphenyl	78		30-130
4-Terphenyl-d14	94		30-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LANDFILL
Project Number: Not Specified

Lab Number: L2451680
Report Date: 09/18/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-05 Batch: WG1971743-2 WG1971743-3								
Acenaphthene	109		88		40-140	21		30
Fluoranthene	123		96		40-140	25		30
Naphthalene	106		86		40-140	21		30
Benzo(a)anthracene	111		88		40-140	23		30
Benzo(a)pyrene	118		94		40-140	23		30
Benzo(b)fluoranthene	120		96		40-140	22		30
Benzo(k)fluoranthene	110		86		40-140	24		30
Chrysene	103		82		40-140	23		30
Acenaphthylene	109		88		40-140	21		30
Anthracene	121		96		40-140	23		30
Benzo(ghi)perylene	117		91		40-140	25		30
Fluorene	110		90		40-140	20		30
Phenanthrene	115		91		40-140	23		30
Dibenzo(a,h)anthracene	118		93		40-140	24		30
Indeno(1,2,3-cd)pyrene	125		99		40-140	23		30
Pyrene	120		94		40-140	24		30
2-Methylnaphthalene	114		92		40-140	21		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: ANDOVER LANDFILL
Project Number: Not Specified

Lab Number: L2451680
Report Date: 09/18/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-05 Batch: WG1971743-2 WG1971743-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Nitrobenzene-d5	107		84		30-130
2-Fluorobiphenyl	102		80		30-130
4-Terphenyl-d14	121		91		30-130

METALS

Project Name: ANDOVER LANDFILL
Lab Number: L2451680
Project Number: Not Specified
Report Date: 09/18/24

SAMPLE RESULTS

Lab ID: L2451680-01
Client ID: SAND 5,000 C4
Sample Location: ANDOVER, MA
Date Collected: 09/10/24 07:10
Date Received: 09/10/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 100%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	8.22		mg/kg	0.783	--	2	09/11/24 21:50	09/17/24 17:55	EPA 3050B	97,6010D	DHL
Barium, Total	15.5		mg/kg	0.783	--	2	09/11/24 21:50	09/17/24 17:55	EPA 3050B	97,6010D	DHL
Cadmium, Total	ND		mg/kg	0.783	--	2	09/11/24 21:50	09/17/24 17:55	EPA 3050B	97,6010D	DHL
Chromium, Total	4.54		mg/kg	0.783	--	2	09/11/24 21:50	09/17/24 17:55	EPA 3050B	97,6010D	DHL
Lead, Total	ND		mg/kg	3.92	--	2	09/11/24 21:50	09/17/24 17:55	EPA 3050B	97,6010D	DHL
Mercury, Total	ND		mg/kg	0.075	--	1	09/11/24 22:54	09/17/24 14:26	EPA 7471B	97,7471B	MJR
Selenium, Total	ND		mg/kg	3.92	--	2	09/11/24 21:50	09/17/24 17:55	EPA 3050B	97,6010D	DHL
Silver, Total	ND		mg/kg	0.783	--	2	09/11/24 21:50	09/17/24 17:55	EPA 3050B	97,6010D	DHL

Project Name: ANDOVER LANDFILL
Lab Number: L2451680
Project Number: Not Specified
Report Date: 09/18/24

SAMPLE RESULTS

Lab ID: L2451680-02
Client ID: SAND 10,000 C4
Sample Location: ANDOVER, MA
Date Collected: 09/10/24 07:15
Date Received: 09/10/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 100%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	8.59		mg/kg	0.751	--	2	09/11/24 21:50	09/17/24 17:59	EPA 3050B	97,6010D	DHL
Barium, Total	12.3		mg/kg	0.751	--	2	09/11/24 21:50	09/17/24 17:59	EPA 3050B	97,6010D	DHL
Cadmium, Total	ND		mg/kg	0.751	--	2	09/11/24 21:50	09/17/24 17:59	EPA 3050B	97,6010D	DHL
Chromium, Total	4.07		mg/kg	0.751	--	2	09/11/24 21:50	09/17/24 17:59	EPA 3050B	97,6010D	DHL
Lead, Total	ND		mg/kg	3.75	--	2	09/11/24 21:50	09/17/24 17:59	EPA 3050B	97,6010D	DHL
Mercury, Total	ND		mg/kg	0.071	--	1	09/11/24 22:54	09/17/24 14:36	EPA 7471B	97,7471B	MJR
Selenium, Total	ND		mg/kg	3.75	--	2	09/11/24 21:50	09/17/24 17:59	EPA 3050B	97,6010D	DHL
Silver, Total	ND		mg/kg	0.751	--	2	09/11/24 21:50	09/17/24 17:59	EPA 3050B	97,6010D	DHL

Project Name: ANDOVER LANDFILL
Lab Number: L2451680
Project Number: Not Specified
Report Date: 09/18/24

SAMPLE RESULTS

Lab ID: L2451680-03
Client ID: SAND 15,000 C4
Sample Location: ANDOVER, MA
Date Collected: 09/10/24 07:20
Date Received: 09/10/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 100%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	10.8		mg/kg	0.767	--	2	09/11/24 21:50	09/17/24 18:03	EPA 3050B	97,6010D	DHL
Barium, Total	16.2		mg/kg	0.767	--	2	09/11/24 21:50	09/17/24 18:03	EPA 3050B	97,6010D	DHL
Cadmium, Total	ND		mg/kg	0.767	--	2	09/11/24 21:50	09/17/24 18:03	EPA 3050B	97,6010D	DHL
Chromium, Total	5.24		mg/kg	0.767	--	2	09/11/24 21:50	09/17/24 18:03	EPA 3050B	97,6010D	DHL
Lead, Total	ND		mg/kg	3.84	--	2	09/11/24 21:50	09/17/24 18:03	EPA 3050B	97,6010D	DHL
Mercury, Total	ND		mg/kg	0.071	--	1	09/11/24 22:54	09/17/24 14:39	EPA 7471B	97,7471B	MJR
Selenium, Total	ND		mg/kg	3.84	--	2	09/11/24 21:50	09/17/24 18:03	EPA 3050B	97,6010D	DHL
Silver, Total	ND		mg/kg	0.767	--	2	09/11/24 21:50	09/17/24 18:03	EPA 3050B	97,6010D	DHL

Project Name: ANDOVER LANDFILL
Lab Number: L2451680
Project Number: Not Specified
Report Date: 09/18/24

SAMPLE RESULTS

Lab ID: L2451680-04
Client ID: SAND 20,000 C4
Sample Location: ANDOVER, MA
Date Collected: 09/10/24 07:25
Date Received: 09/10/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 100%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	7.17		mg/kg	0.771	--	2	09/11/24 21:50	09/17/24 18:28	EPA 3050B	97,6010D	DHL
Barium, Total	12.6		mg/kg	0.771	--	2	09/11/24 21:50	09/17/24 18:28	EPA 3050B	97,6010D	DHL
Cadmium, Total	ND		mg/kg	0.771	--	2	09/11/24 21:50	09/17/24 18:28	EPA 3050B	97,6010D	DHL
Chromium, Total	4.18		mg/kg	0.771	--	2	09/11/24 21:50	09/17/24 18:28	EPA 3050B	97,6010D	DHL
Lead, Total	ND		mg/kg	3.86	--	2	09/11/24 21:50	09/17/24 18:28	EPA 3050B	97,6010D	DHL
Mercury, Total	ND		mg/kg	0.069	--	1	09/11/24 22:54	09/17/24 14:43	EPA 7471B	97,7471B	MJR
Selenium, Total	ND		mg/kg	3.86	--	2	09/11/24 21:50	09/17/24 18:28	EPA 3050B	97,6010D	DHL
Silver, Total	ND		mg/kg	0.771	--	2	09/11/24 21:50	09/17/24 18:28	EPA 3050B	97,6010D	DHL

Project Name: ANDOVER LANDFILL
Lab Number: L2451680
Project Number: Not Specified
Report Date: 09/18/24

SAMPLE RESULTS

Lab ID: L2451680-05
Client ID: SAND 25,000 C4
Sample Location: ANDOVER, MA
Date Collected: 09/10/24 07:30
Date Received: 09/10/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 100%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	6.64		mg/kg	0.792	--	2	09/11/24 21:50	09/17/24 18:32	EPA 3050B	97,6010D	DHL
Barium, Total	14.7		mg/kg	0.792	--	2	09/11/24 21:50	09/17/24 18:32	EPA 3050B	97,6010D	DHL
Cadmium, Total	ND		mg/kg	0.792	--	2	09/11/24 21:50	09/17/24 18:32	EPA 3050B	97,6010D	DHL
Chromium, Total	4.08		mg/kg	0.792	--	2	09/11/24 21:50	09/17/24 18:32	EPA 3050B	97,6010D	DHL
Lead, Total	ND		mg/kg	3.96	--	2	09/11/24 21:50	09/17/24 18:32	EPA 3050B	97,6010D	DHL
Mercury, Total	ND		mg/kg	0.065	--	1	09/11/24 22:54	09/17/24 14:46	EPA 7471B	97,7471B	MJR
Selenium, Total	ND		mg/kg	3.96	--	2	09/11/24 21:50	09/17/24 18:32	EPA 3050B	97,6010D	DHL
Silver, Total	ND		mg/kg	0.792	--	2	09/11/24 21:50	09/17/24 18:32	EPA 3050B	97,6010D	DHL

Project Name: ANDOVER LANDFILL **Lab Number:** L2451680

Project Number: Not Specified **Report Date:** 09/18/24

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-05 Batch: WG1970084-1										
Arsenic, Total	ND		mg/kg	0.400	--	1	09/11/24 21:50	09/17/24 16:39	97,6010D	DHL
Barium, Total	ND		mg/kg	0.400	--	1	09/11/24 21:50	09/17/24 16:39	97,6010D	DHL
Cadmium, Total	ND		mg/kg	0.400	--	1	09/11/24 21:50	09/17/24 16:39	97,6010D	DHL
Chromium, Total	ND		mg/kg	0.400	--	1	09/11/24 21:50	09/17/24 16:39	97,6010D	DHL
Lead, Total	ND		mg/kg	2.00	--	1	09/11/24 21:50	09/17/24 16:39	97,6010D	DHL
Selenium, Total	ND		mg/kg	2.00	--	1	09/11/24 21:50	09/17/24 16:39	97,6010D	DHL
Silver, Total	ND		mg/kg	0.400	--	1	09/11/24 21:50	09/17/24 16:39	97,6010D	DHL

Prep Information

Digestion Method: EPA 3050B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-05 Batch: WG1970085-1										
Mercury, Total	ND		mg/kg	0.083	--	1	09/11/24 22:54	09/17/24 13:23	97,7471B	MJR

Prep Information

Digestion Method: EPA 7471B

Lab Control Sample Analysis

Batch Quality Control

Project Name: ANDOVER LANDFILL

Project Number: Not Specified

Lab Number: L2451680

Report Date: 09/18/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-05 Batch: WG1970084-2 WG1970084-3 SRM Lot Number: D123-540								
Arsenic, Total	98		98		82-118	0		30
Barium, Total	99		90		82-118	10		30
Cadmium, Total	104		99		83-118	5		30
Chromium, Total	98		97		81-118	1		30
Lead, Total	100		100		82-119	0		30
Selenium, Total	101		101		81-119	0		30
Silver, Total	101		101		79-120	0		30
MCP Total Metals - Mansfield Lab Associated sample(s): 01-05 Batch: WG1970085-2 WG1970085-3 SRM Lot Number: D123-540								
Mercury, Total	92		89		67-132	3		30

INORGANICS
&
MISCELLANEOUS

Project Name: ANDOVER LANDFILL
Project Number: Not Specified

Lab Number: L2451680
Report Date: 09/18/24

SAMPLE RESULTS

Lab ID: L2451680-01
Client ID: SAND 5,000 C4
Sample Location: ANDOVER, MA

Date Collected: 09/10/24 07:10
Date Received: 09/10/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	99.9		%	0.100	NA	1	-	09/11/24 01:06	121,2540G	WJM

Project Name: ANDOVER LANDFILL
Project Number: Not Specified

Lab Number: L2451680
Report Date: 09/18/24

SAMPLE RESULTS

Lab ID: L2451680-02
Client ID: SAND 10,000 C4
Sample Location: ANDOVER, MA

Date Collected: 09/10/24 07:15
Date Received: 09/10/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	99.9		%	0.100	NA	1	-	09/11/24 01:06	121,2540G	WJM

Project Name: ANDOVER LANDFILL
Project Number: Not Specified

Lab Number: L2451680
Report Date: 09/18/24

SAMPLE RESULTS

Lab ID: L2451680-03
Client ID: SAND 15,000 C4
Sample Location: ANDOVER, MA

Date Collected: 09/10/24 07:20
Date Received: 09/10/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	99.9		%	0.100	NA	1	-	09/11/24 01:06	121,2540G	WJM

Project Name: ANDOVER LANDFILL
Project Number: Not Specified

Lab Number: L2451680
Report Date: 09/18/24

SAMPLE RESULTS

Lab ID: L2451680-04
Client ID: SAND 20,000 C4
Sample Location: ANDOVER, MA

Date Collected: 09/10/24 07:25
Date Received: 09/10/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	99.6		%	0.100	NA	1	-	09/11/24 01:06	121,2540G	WJM

Project Name: ANDOVER LANDFILL
Project Number: Not Specified

Lab Number: L2451680
Report Date: 09/18/24

SAMPLE RESULTS

Lab ID: L2451680-05
Client ID: SAND 25,000 C4
Sample Location: ANDOVER, MA

Date Collected: 09/10/24 07:30
Date Received: 09/10/24
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	99.9		%	0.100	NA	1	-	09/11/24 01:06	121,2540G	WJM

Project Name: ANDOVER LANDFILL
Project Number: Not Specified

Lab Number: L2451680
Report Date: 09/18/24

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2451680-01A	Plastic 2oz unpreserved for TS	A	NA		6.0	Y	Absent		TS(7)
L2451680-01B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		6.0	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)
L2451680-01C	Glass 120ml/4oz unpreserved	A	NA		6.0	Y	Absent		MCP-PAH-21(14)
L2451680-02A	Plastic 2oz unpreserved for TS	A	NA		6.0	Y	Absent		TS(7)
L2451680-02B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		6.0	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)
L2451680-02C	Glass 120ml/4oz unpreserved	A	NA		6.0	Y	Absent		MCP-PAH-21(14)
L2451680-03A	Plastic 2oz unpreserved for TS	A	NA		6.0	Y	Absent		TS(7)
L2451680-03B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		6.0	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-CD-6010T-10(180),MCP-7471T-10(28),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)
L2451680-03C	Glass 120ml/4oz unpreserved	A	NA		6.0	Y	Absent		MCP-PAH-21(14)
L2451680-04A	Plastic 2oz unpreserved for TS	A	NA		6.0	Y	Absent		TS(7)
L2451680-04B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		6.0	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)
L2451680-04C	Glass 120ml/4oz unpreserved	A	NA		6.0	Y	Absent		MCP-PAH-21(14)
L2451680-05A	Plastic 2oz unpreserved for TS	A	NA		6.0	Y	Absent		TS(7)

*Values in parentheses indicate holding time in days

Project Name: ANDOVER LANDFILL
Project Number: Not Specified

Lab Number: L2451680
Report Date: 09/18/24

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2451680-05B	Metals Only-Glass 60mL/2oz unpreserved	A	NA		6.0	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-CD-6010T-10(180),MCP-7471T-10(28),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)
L2451680-05C	Glass 120ml/4oz unpreserved	A	NA		6.0	Y	Absent		MCP-PAH-21(14)

*Values in parentheses indicate holding time in days

Project Name:	ANDOVER LANDFILL	**Lab Number:**	L2451680
Project Number:	Not Specified	**Report Date:**	09/18/24

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name:	ANDOVER LANDFILL	**Lab Number:**	L2451680
Project Number:	Not Specified	**Report Date:**	09/18/24

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report

Project Name:	ANDOVER LANDFILL	**Lab Number:**	L2451680
Project Number:	Not Specified	**Report Date:**	09/18/24

Data Qualifiers

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: Data Usability Report

Project Name:	ANDOVER LANDFILL	**Lab Number:**	L2451680
Project Number:	Not Specified	**Report Date:**	09/18/24

REFERENCES

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010; WSC-CAM-IIIA and IIID, January 2024; WSC-CAM-IIIB and VA, February 2024; and WSC-CAM-VB and VC, April 2024.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

141 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA and IIB, November 2021.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol, Azobenzene; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Nonpotable Water: EPA RSK-175 Dissolved Gases
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 9/16/24

ALPHA Job #: L2451680

8 Walkup Drive
Westboro, MA 01581
Tel: 508-898-9220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

Client Information

Client: J Bates and Son

Address: 57 Lawrence St,
Clinton, MA 01510

Phone: 978-368-7001

Email: smcnally@jbatesandson.com

Project Information

Project Name: Andover Landfill

Project Location: Andover MA

Project #:

Project Manager: Jennifer Byrnes

ALPHA Quote #:

Report Information - Data Deliverables

☐ ADEx ☑ EMAIL

Billing Information

☑ Same as Client info PO #: Andover

Regulatory Requirements & Project Information Requirements

☑ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods

☐ Yes ☐ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)

☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)

☐ Yes ☐ No NPDES RGP

☐ Other State /Fed Program _____ Criteria _____

Turn-Around Time

☑ Standard ☐ RUSH (only confirmed if pre-approved)

Date Due:

Additional Project Information:

* see bottle order
# 483766 for analysis

ANALYSIS

VOC: ☐ 8260 ☐ 624 ☐ 524.2

SVOC: ☐ ABN ☐ PAH

METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15

METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13

EPH: ☐ Ranges & Targets ☐ Ranges Only

VPH: ☐ Ranges & Targets ☐ Ranges Only

☐ PCB ☐ PEST

TPH: ☐ Quant Only ☐ Fingerprint

SAMPLE INFO

Filtration
☐ Field
☐ Lab to do

Preservation
☐ Lab to do

Sample Comments

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials
51680-01	Sand 5,000 cy	9/10/24	7:10		SMN
-02	Sand 10,000 cy	9/10/24	7:15		SMN
-03	Sand 15,000 cy	9/10/24	7:20		SMN
-04	Sand 20,000 cy	9/10/24	7:25		SMN
-05	Sand 25,000 cy	9/10/24	7:30		SMN

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H = $Na_2S_2O_3$
I= Ascorbic Acid
J = NH_4Cl
K= Zn Acetate
O= Other

Container Type																							
Preservative																							

Relinquished By:	Date/Time	Received By:	Date/Time
Scott McNally	9/16/24 2:40	RBS	9/16/24 14:40

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO. 01-01 (rev. 12-Mar-2012)

Serial_No:09182410:33

Bottle Order Request

Bottle Order # 483766

SEP-05-24 14:51:41

Acctnum : JBATES
Contact Name : Seth McNally
Projectnum :

Company : J. Bates & Son, LLC
Client PM :
Projectname : Andover Landfill Project

Request date : 09/05/24
Order taken by : Mark Oliver

Status : NEED
Linked Call :

Sample delivery date :
Projected TAT :

Completed by :
Date Completed :

Delivery method : P/U Flanders am

Matrix : SOIL
 # Samples : 5
Client IDs : 1

Analytes : Total Solids - SM 2540
MCP 8270E - PAHs
MCP 6010D/7471B - Total RCRA 8 Metals

Container	Quantity	Analyte Label
Glass 120ml/4oz unpreserved	1	MCP-PAH-21
Metals Only-Glass 60mL/2oz unpr	1	TRCRA8
Plastic 2oz unpreserved for TS	1	TS

Bottle Quantity Summary:

Glass 120ml/4oz unpreserved	5
Metals Only-Glass 60mL/2oz unpr	5
Plastic 2oz unpreserved for TS	5

Trip Blanks, Field Blanks and Flow Controllers:

Special Shipping Requirements

Cooler	Dangerous	Certified	NJ Courier Pickup Label	Return Shipping Labels
X				

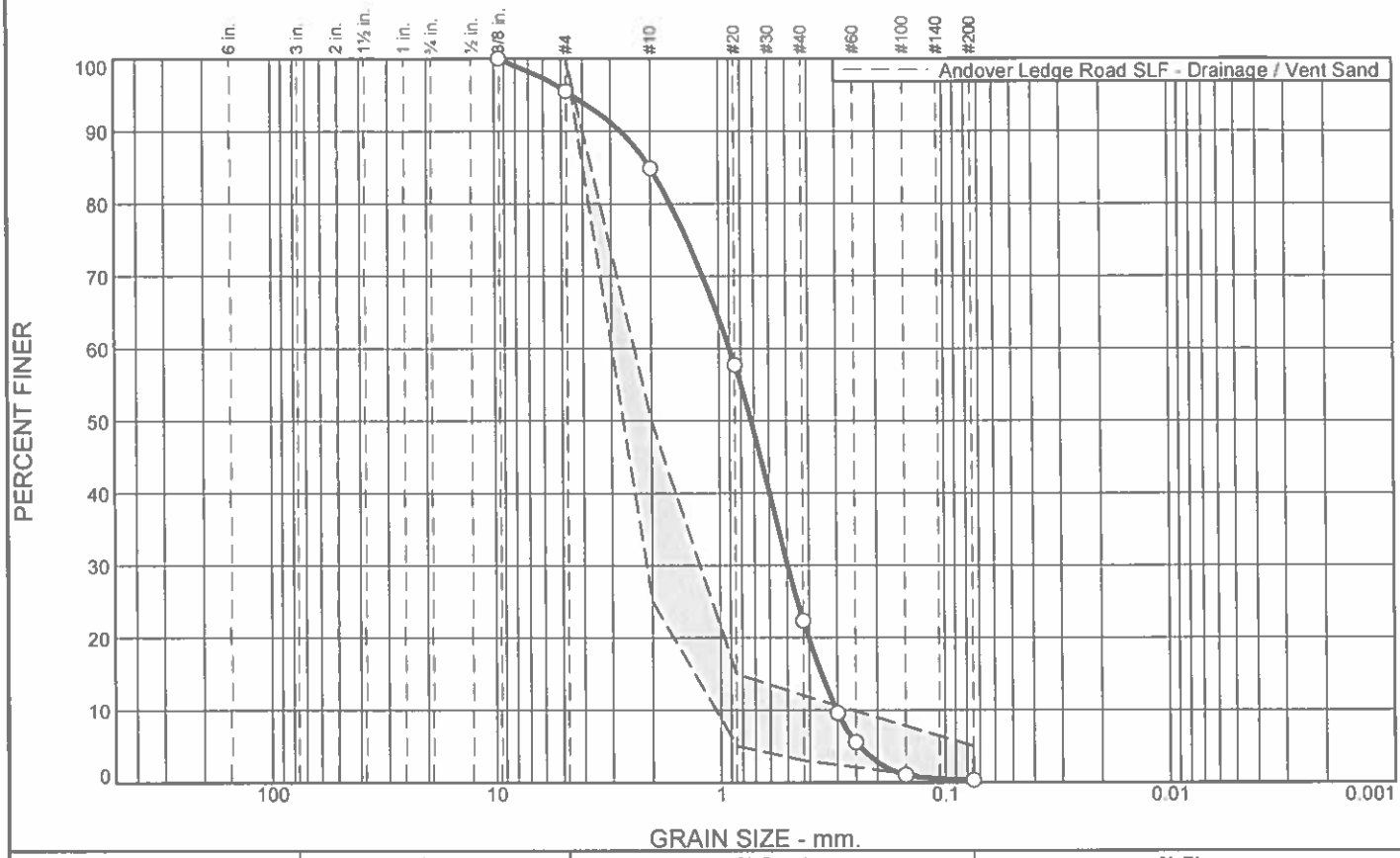
Pending Shipping Date(s)
09/06/24

If you have questions on this Bottle Order, need to order additional bottles or schedule a Sample Pickup, please call a member of our Pace team at 508-898-9220.

PLEASE PUT SAMPLES ON ICE
EXCEPT CANISTER OR BAG SAMPLES

Link to Pace Sampling Reference Guide

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	4.5	10.6	62.6	22.0	0.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	95.5	100	X
#10	84.9	25-50	X
#20	57.7	5-15	X
#40	22.3	3-12	X
#50	9.6		
#60	5.6		
#100	1.0		
#200	0.3	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan sand trace gravel trace silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 2.0134 D_{60}= 0.8988 D_{50}= 0.7205
D_{30}= 0.4978 D_{15}= 0.3535 D_{10}= 0.3038
C_u= 2.96 C_c= 0.91

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample submitted by client 09/11/24
Did not meet project sand gradation limits

Sample No.: L-35179 **Source of Sample:** Andover SLF **Date:** 9/16/24
Location: Coarse Sand **Elev./Depth:** 25.500cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

September 17, 2024

Mr. John Bates
J. Bates & Son, LLC
57 Lawrence Street
Clinton MA 01510

RE: Soil & Permeability Test Results
Andover Ledge Rd SLF
Andover, NH **Project # 26023**

Dear Mr. Bates:

Presented herein are the results of laboratory testing on a sample SP tan m/f sand trace gravel trace silt (**#L-35180**), submitted on September 11, 2024. Testing consisted of a one-point constant head permeability test (ASTM D-2434).

The permeability specimen was then prepared by compacting a calculated quantity of soil into a 1/30 cubic foot rigid mold. The test conditions and result are summarized on the Table below:

 # L-35180 – Sand 27000 cy
USCS Soil Classification = SP tan m/f sand trace gravel trace silt

Estimated Compaction (%)	Permeability (cm/sec)
90	**1.8×10^{-2}**

As can be seen above, the soil in question showed a permeability of 1.8×10^{-2} when compacted to approximately 90%, which met both "Coarse Gas Venting" layer specification of 1×10^{-3} cm/sec and "Drainage" layer specification 1.2×10^{-2} However, it should be noted that the permeability of cohesionless soils is inversely related to the degree of compaction but independent of the compacted moisture content.

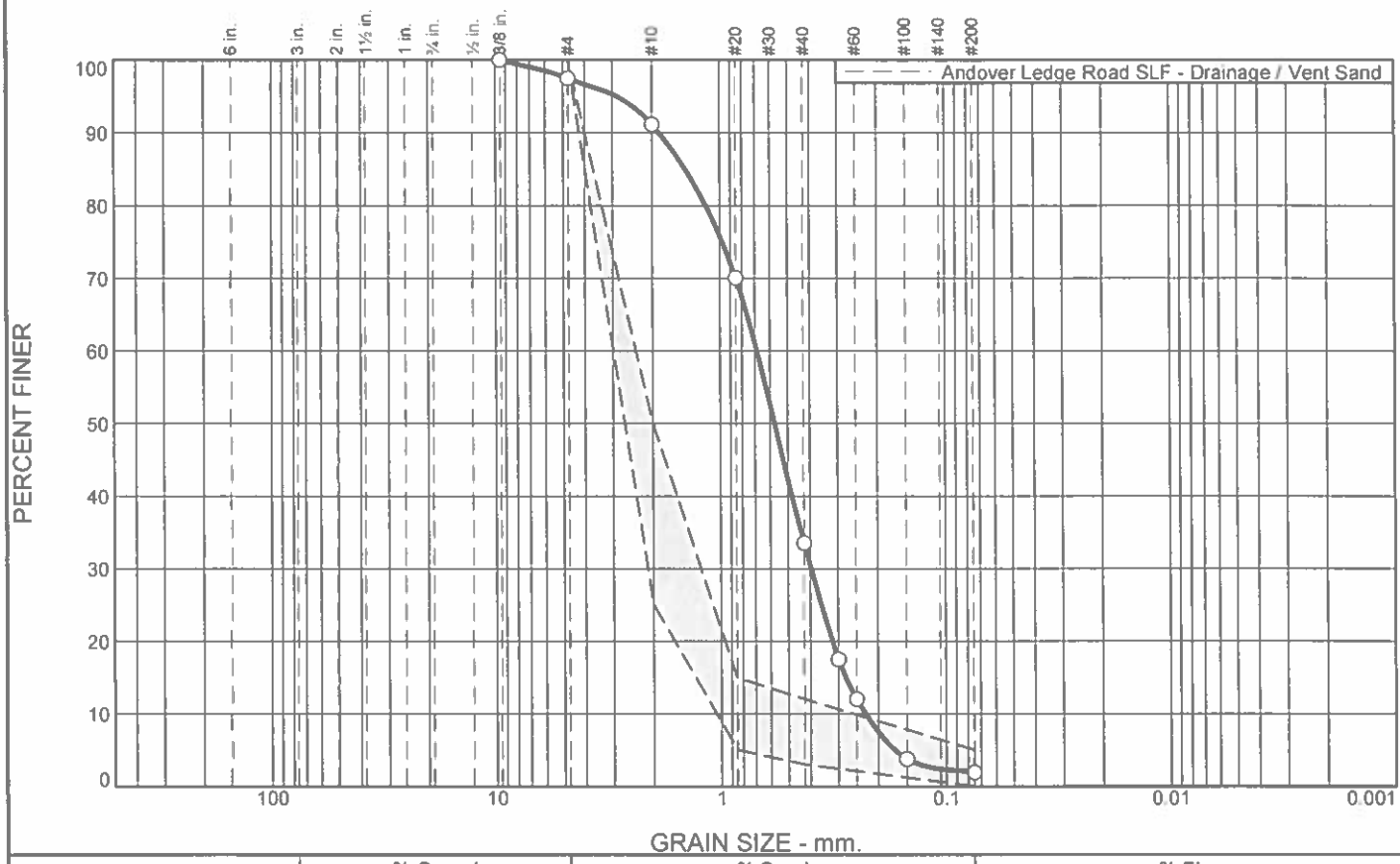
Should you have any questions or wish to discuss the above soil test results or attached gradation ("sieve") curve, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.5	6.4	57.6	31.6	1.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	97.5	100	X
#10	91.1	25-50	X
#20	70.0	5-15	X
#40	33.5	3-12	X
#50	17.5		
#60	12.0		
#100	3.8		
#200	1.9	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace gravel trace silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.4263 D_{60}= 0.6856 D_{50}= 0.5733
D_{30}= 0.3959 D_{15}= 0.2792 D_{10}= 0.2280
C_u= 3.01 C_c= 1.00

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample submitted by client 09/11/24
Did not meet project sand gradation limits

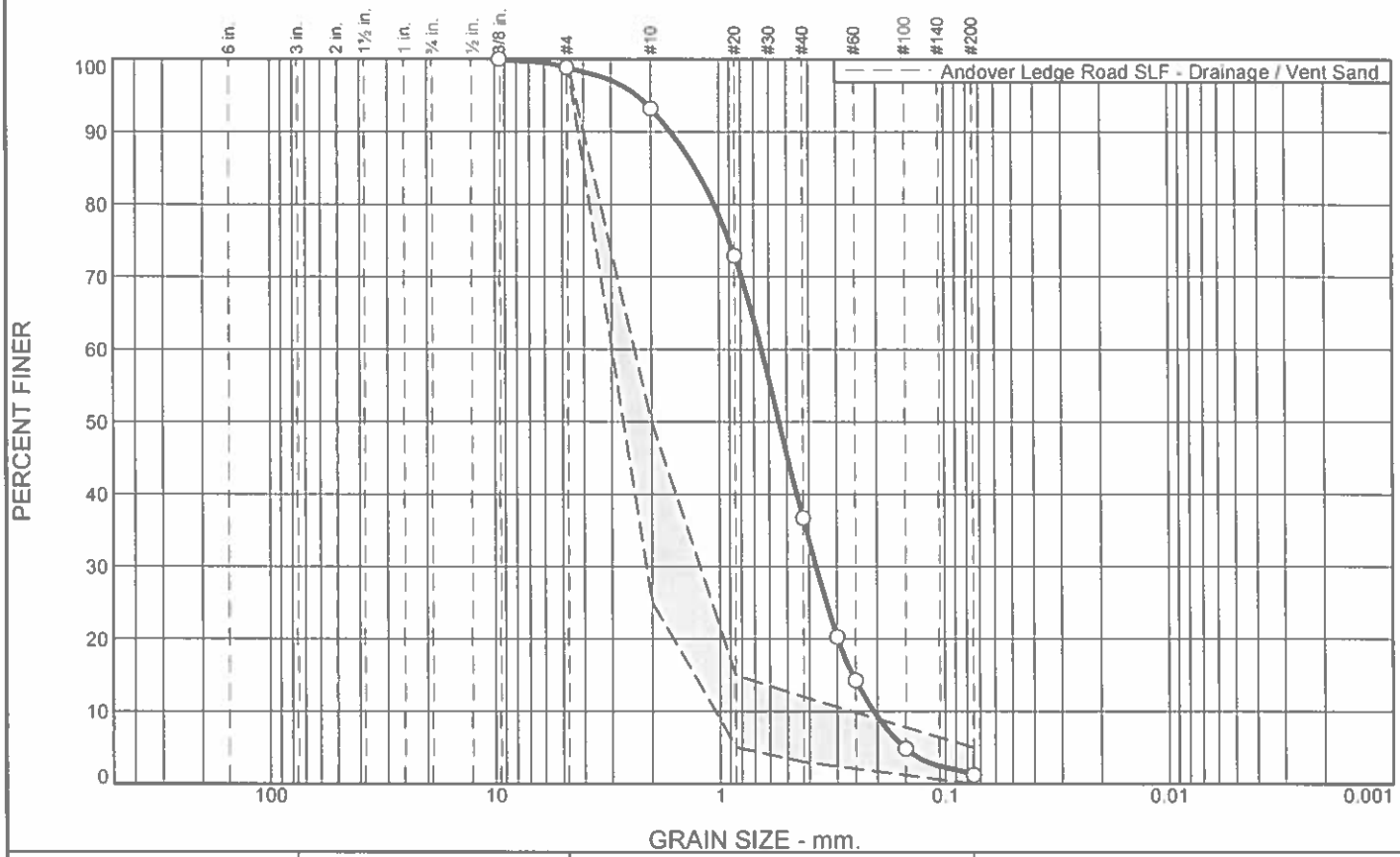
Sample No.: L-35180 **Source of Sample:** Andover SLF **Date:** 9/17/24
Location: Coarse Sand **Elev./Depth:** 27.000cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.1	5.7	56.5	35.5	1.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	98.9	100	X
#10	93.2	25-50	X
#20	72.9	5-15	X
#40	36.7	3-12	X
#50	20.3		
#60	14.3		
#100	4.8		
#200	1.2	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace silt trace gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.2762 D_{60}= 0.6484 D_{50}= 0.5429
D_{30}= 0.3716 D_{15}= 0.2567 D_{10}= 0.2073
C_u= 3.13 C_c= 1.03

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample submitted by client 09/11/24
Did not meet project sand gradation limits

Sample No.: L-35181 **Source of Sample:** Andover SLF **Date:** 9/16/24
Location: Coarse Sand **Elev./Depth:** 28.500cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

September 17, 2024

Mr. John Bates
J. Bates & Son, LLC
57 Lawrence Street
Clinton MA 01510

RE: Soil & Permeability Test Results
Andover Ledge Rd SLF
Andover, NH **Project # 26023**

Dear Mr. Bates:

Presented herein are the results of laboratory testing on a sample SP tan m/f sand trace gravel trace silt (**#L-35182**), submitted on September 11, 2024. Testing consisted of a one-point constant head permeability test (ASTM D-2434).

The permeability specimen was then prepared by compacting a calculated quantity of soil into a 1/30 cubic foot rigid mold. The test conditions and result are summarized on the Table below:

 # L-35182 – Sand 30000 cy
USCS Soil Classification = SP tan m/f sand trace gravel trace silt

Estimated Compaction (%)	Permeability (cm/sec)
90	**1.1×10^{-2}**

As can be seen above, the soil in question showed a permeability of 1.1×10^{-2} when compacted to approximately 90%, which met both "Coarse Gas Venting" layer specification of 1×10^{-3} cm/sec and "Drainage" layer specification 1.2×10^{-2} However, it should be noted that the permeability of cohesionless soils is inversely related to the degree of compaction but independent of the compacted moisture content.

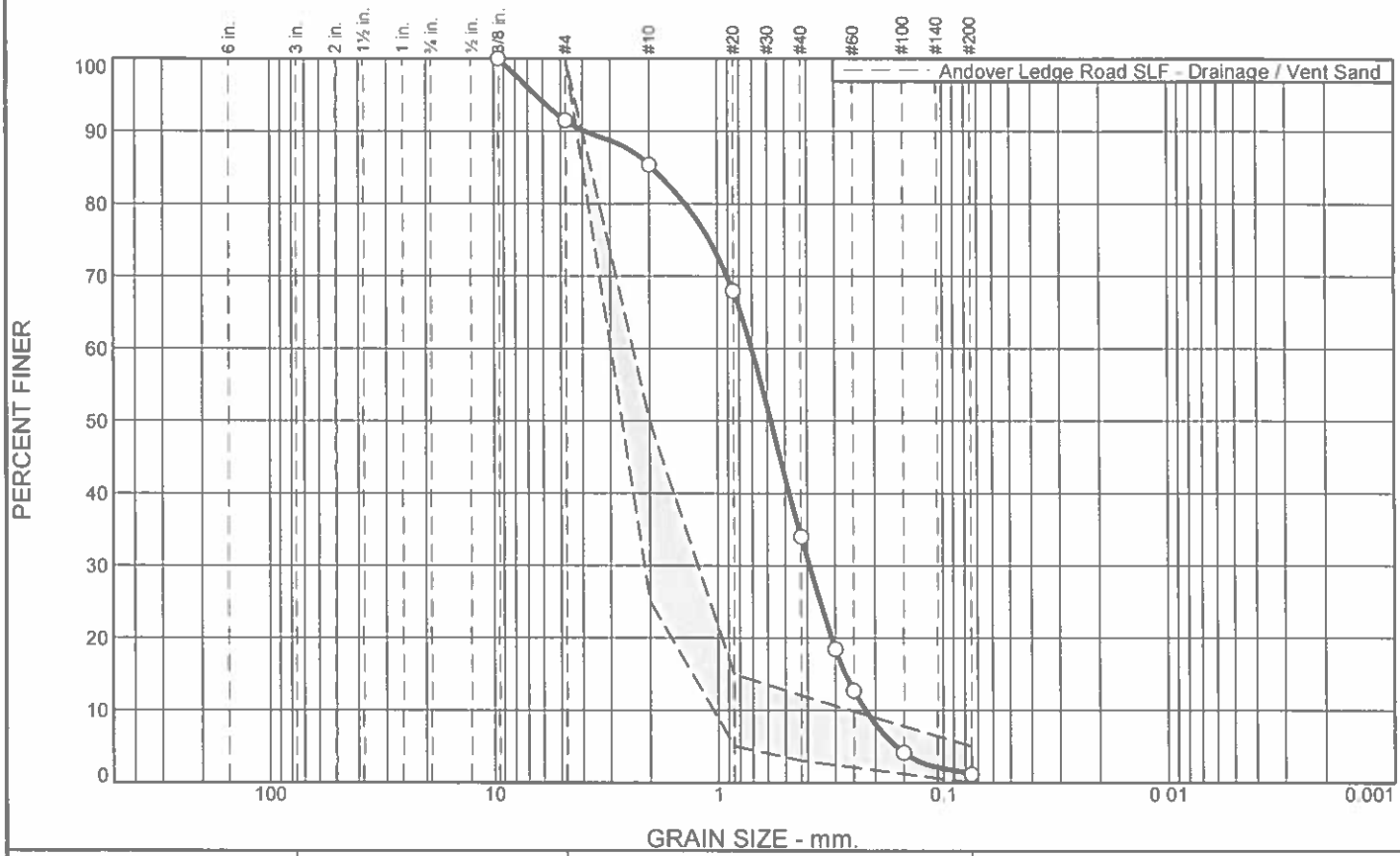
Should you have any questions or wish to discuss the above soil test results or attached gradation ("sieve") curve, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	8.5	6.2	51.3	32.9	1.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/8"	100.0		
#4	91.5	100	X
#10	85.3	25-50	X
#20	67.9	5-15	X
#40	34.0	3-12	X
#50	18.5		
#60	12.7		
#100	4.1		
#200	1.1	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace gravel trace silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.9511 D_{60}= 0.7035 D_{50}= 0.5791
D_{30}= 0.3906 D_{15}= 0.2715 D_{10}= 0.2212
C_u= 3.18 C_c= 0.98

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample submitted by client 09/11/24
Did not meet project sand gradation limits

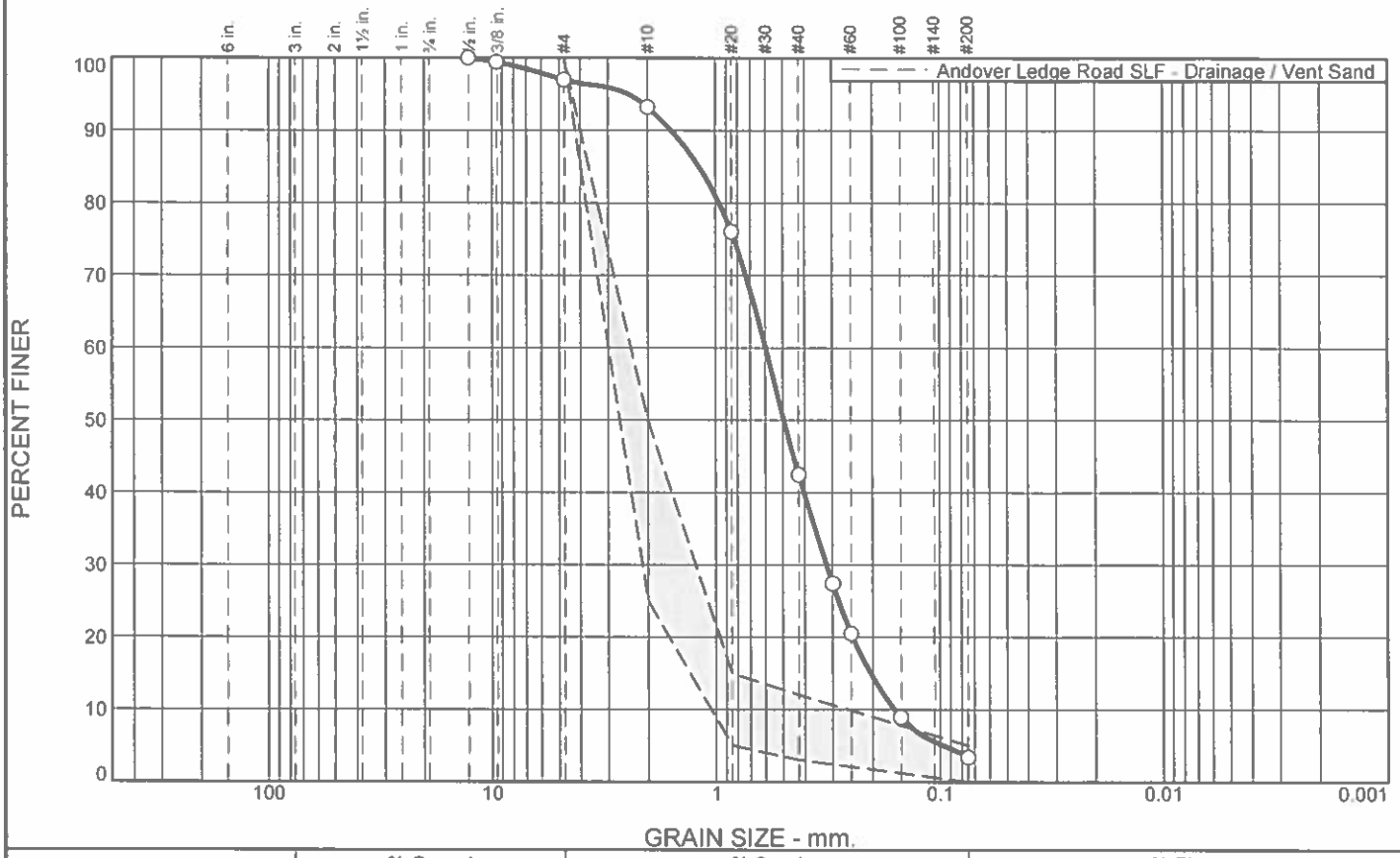
Sample No.: L-35182 **Source of Sample:** Andover SLF **Date:** 9/17/24
Location: Coarse Sand **Elev./Depth:** 30.000cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.0	3.8	50.8	39.0	3.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	99.4		
#4	97.0	100	X
#10	93.2	25-50	X
#20	76.0	5-15	X
#40	42.4	3-12	X
#50	27.4		
#60	20.5		
#100	8.9		
#200	3.4	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace silt trace gravel

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.1806 D_{60}= 0.5984 D_{50}= 0.4954
D_{30}= 0.3194 D_{15}= 0.2042 D_{10}= 0.1602
C_u= 3.74 C_c= 1.06

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample was submitted by client on 10/03/24
Did not meet "Sand" gradation limits

Sample No.: L35335 **Source of Sample:** Andover SLF **Date:** 10/8/24
Location: DPW Materials - Coarse Sand **Elev./Depth:** 31500 cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

October 8 2024

Mr. John Bates
J. Bates & Son, LLC
57 Lawrence Street
Clinton MA 01510

RE: Soil & Permeability Test Results
Andover Ledge Rd SLF
Andover, NH **Project # 26023**

Dear Mr. Bates:

Presented herein are the results of laboratory testing on a sample SP tan m/f sand trace gravel trace silt (**#L-35336**), submitted on October 3, 2024. Testing consisted of a one-point constant head permeability test (ASTM D-2434).

The permeability specimen was then prepared by compacting a calculated quantity of soil into a 1/30 cubic foot rigid mold. The test conditions and results are summarized on the Table below:

 # L-35336 – Sand 33000 cy
USCS Soil Classification = SP tan m/f sand trace gravel trace silt

Estimated Compaction (%)	Permeability (cm/sec)
90	**1.4×10^{-2}**

As can be seen above, the soil in question showed a permeability of 1.4×10^{-2} when compacted to approximately 90%, which met both "Coarse Gas Venting" layer specification of 1×10^{-3} cm/sec and "Drainage" layer specification 1.2×10^{-2} However, it should be noted that the permeability of cohesionless soils is inversely related to the degree of compaction but independent of the compacted moisture content.

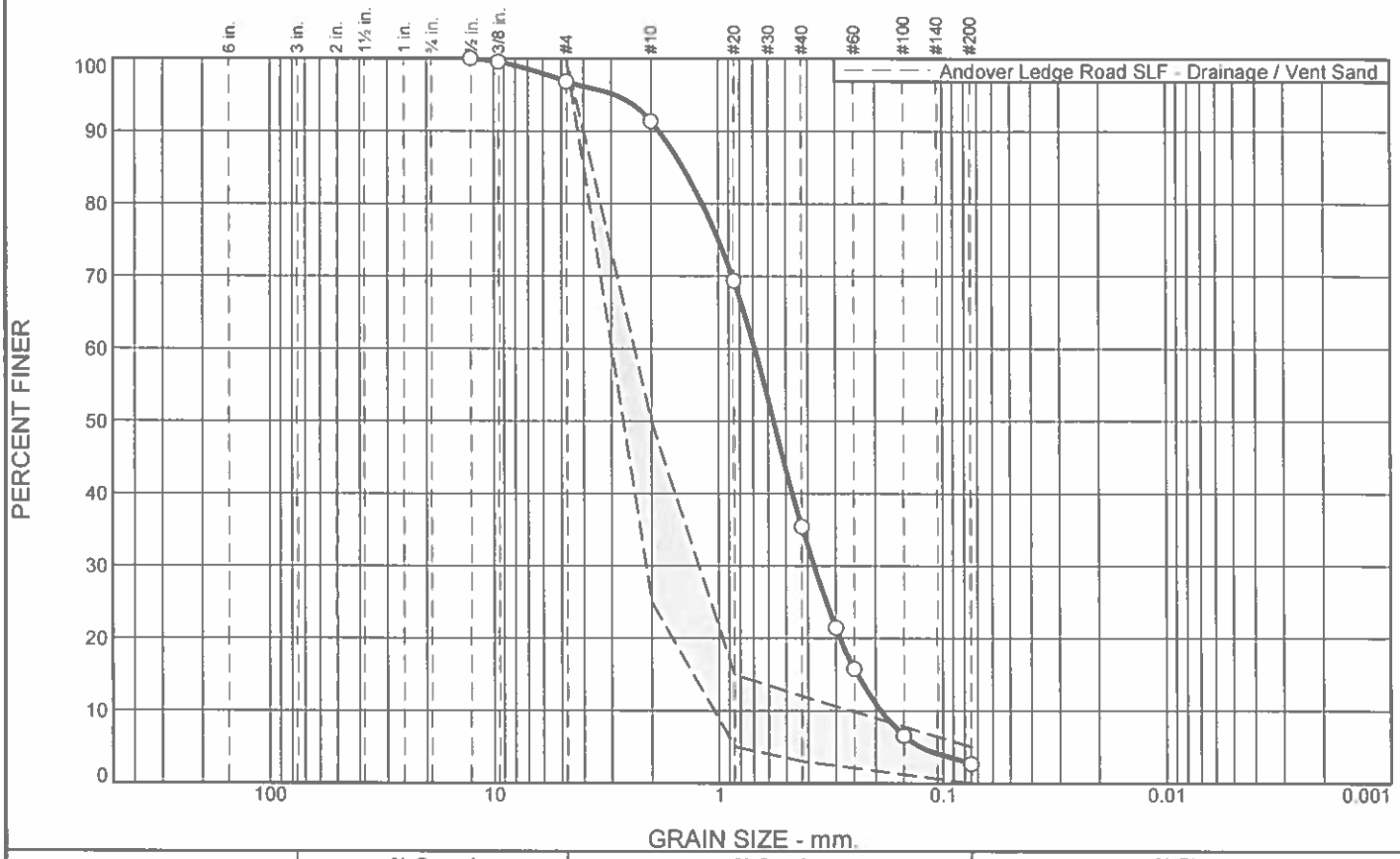
Should you have any questions or wish to discuss the above soil test results or attached gradation ("sieve") curve, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.2	5.4	56.0	32.8	2.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	99.5		
#4	96.8	100	X
#10	91.4	25-50	X
#20	69.4	5-15	X
#40	35.4	3-12	X
#50	21.5		
#60	15.8		
#100	6.6		
#200	2.6	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace gravel trace silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.4373 D_{60}= 0.6879 D_{50}= 0.5678
D_{30}= 0.3744 D_{15}= 0.2418 D_{10}= 0.1897
C_u= 3.63 C_c= 1.07

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample was submitted by client on 10/03/24
Did not meet "Sand" gradation limits

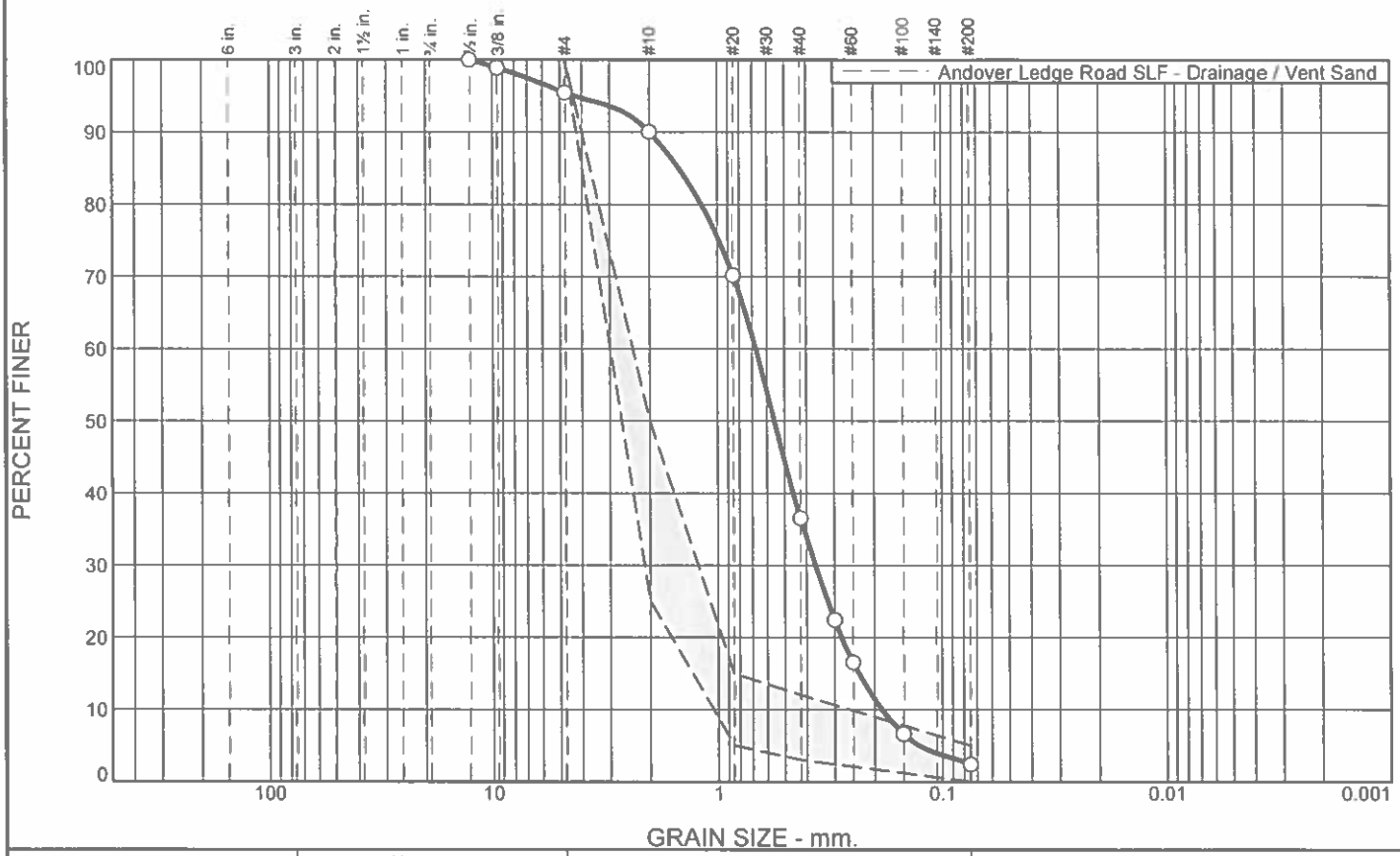
Sample No.: L35336 **Source of Sample:** Andover SLF **Date:** 10/8/24
Location: DPW Materials - Coarse Sand **Elev./Depth:** 33000 cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	4.5	5.5	53.5	34.1	2.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	98.9		
#4	95.5	100	X
#10	90.0	25-50	X
#20	70.2	5-15	X
#40	36.5	3-12	X
#50	22.4		
#60	16.6		
#100	6.6		
#200	2.4	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace gravel trace silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.4809 D_{60}= 0.6740 D_{50}= 0.5563
D_{30}= 0.3648 D_{15}= 0.2350 D_{10}= 0.1862
C_u= 3.62 C_c= 1.06

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample was submitted by client on 10/03/24
Did not meet "Sand" gradation limits

Sample No.: L35337 **Source of Sample:** Andover SLF **Date:** 10/8/24
Location: DPW Materials - Coarse Sand **Elev./Depth:** 34500 cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

October 8 2024

Mr. John Bates
J. Bates & Son, LLC
57 Lawrence Street
Clinton MA 01510

RE: Soil & Permeability Test Results
Andover Ledge Rd SLF
Andover, NH **Project # 26023**

Dear Mr. Bates:

Presented herein are the results of laboratory testing on a sample SP tan m/f sand trace gravel trace silt (**#L-35338**), submitted on October 3, 2024. Testing consisted of a one-point constant head permeability test (ASTM D-2434).

The permeability specimen was then prepared by compacting a calculated quantity of soil into a 1/30 cubic foot rigid mold. The test conditions and results are summarized on the Table below:

 # L-35338 – Sand 36000 cy
USCS Soil Classification = SP tan m/f sand trace gravel trace silt

Estimated Compaction (%)	Permeability (cm/sec)
90	**1.5×10^{-2}**

As can be seen above, the soil in question showed a permeability of 1.5×10^{-2} when compacted to approximately 90%, which met both "Coarse Gas Venting" layer specification of 1×10^{-3} cm/sec and "Drainage" layer specification 1.2×10^{-2} However, it should be noted that the permeability of cohesionless soils is inversely related to the degree of compaction but independent of the compacted moisture content.

Should you have any questions or wish to discuss the above soil test results or attached gradation ("sieve") curve, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

Particle Size Distribution Report

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.4	5.9	52.6	35.0	3.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	99.4		
#4	96.6	100	X
#10	90.7	25-50	X
#20	71.8	5-15	X
#40	38.1	3-12	X
#50	24.4		
#60	18.2		
#100	7.6		
#200	3.1	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace gravel trace silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.4089 D_{60}= 0.6532 D_{50}= 0.5407
D_{30}= 0.3484 D_{15}= 0.2211 D_{10}= 0.1745
C_u= 3.74 C_c= 1.06

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample was submitted by client on 10/03/24
Did not meet "Sand" gradation limits

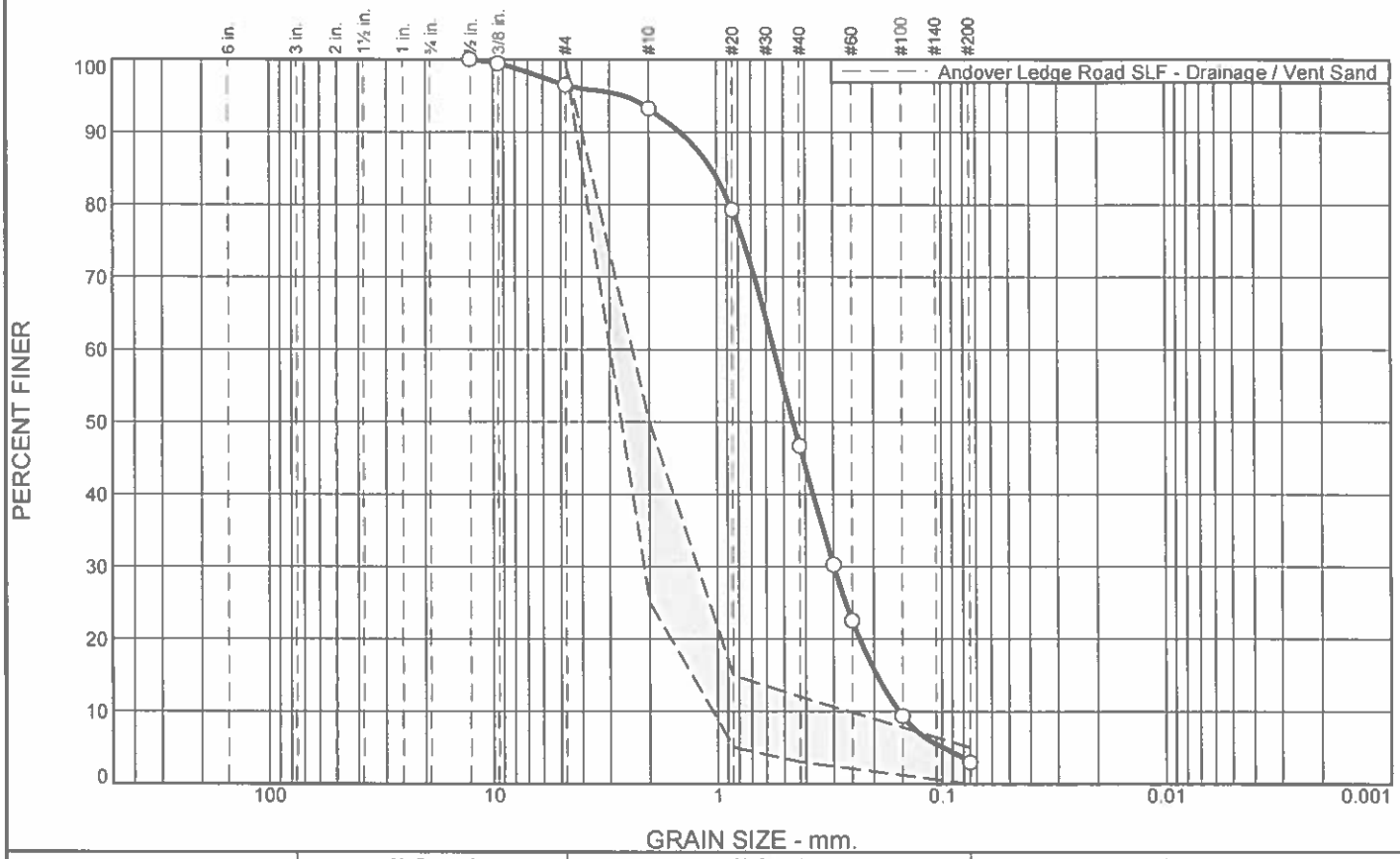
Sample No.: L35338 **Source of Sample:** Andover SLF **Date:** 10/8/24
Location: DPW Materials - Coarse Sand **Elev./Depth:** 36000 cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.5	3.3	46.5	43.7	3.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	99.4		
#4	96.5	100	X
#10	93.2	25-50	X
#20	79.3	5-15	X
#40	46.7	3-12	X
#50	30.3		
#60	22.6		
#100	9.4		
#200	3.0	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace gravel trace silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.0589 D_{60}= 0.5530 D_{50}= 0.4553
D_{30}= 0.2981 D_{15}= 0.1942 D_{10}= 0.1552
C_u= 3.56 C_c= 1.04

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample was submitted by client on 10/03/24
Did not meet "Sand" gradation limits

Sample No.: L35339 **Source of Sample:** Andover SLF **Date:** 10/8/24
Location: DPW Materials - Coarse Sand **Elev./Depth:** 37500 cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

October 8 2024

Mr. John Bates
J. Bates & Son, LLC
57 Lawrence Street
Clinton MA 01510

RE: Soil & Permeability Test Results
Andover Ledge Rd SLF
Andover, NH **Project # 26023**

Dear Mr. Bates:

Presented herein are the results of laboratory testing on a sample SP tan m/f sand trace gravel trace silt **(#L-35340)**, submitted on October 3, 2024. Testing consisted of a one-point constant head permeability test (ASTM D-2434).

The permeability specimen was then prepared by compacting a calculated quantity of soil into a 1/30 cubic foot rigid mold. The test conditions and results are summarized on the Table below:

 # L-35340 – Sand 39000 cy
USCS Soil Classification = SP tan m/f sand trace gravel trace silt

Estimated Compaction (%)	Permeability (cm/sec)
90	**1.3×10^{-2}**

As can be seen above, the soil in question showed a permeability of 1.3×10^{-2} when compacted to approximately 90%, which met both "Coarse Gas Venting" layer specification of 1×10^{-3} cm/sec and "Drainage" layer specification 1.2×10^{-2} However, it should be noted that the permeability of cohesionless soils is inversely related to the degree of compaction but independent of the compacted moisture content.

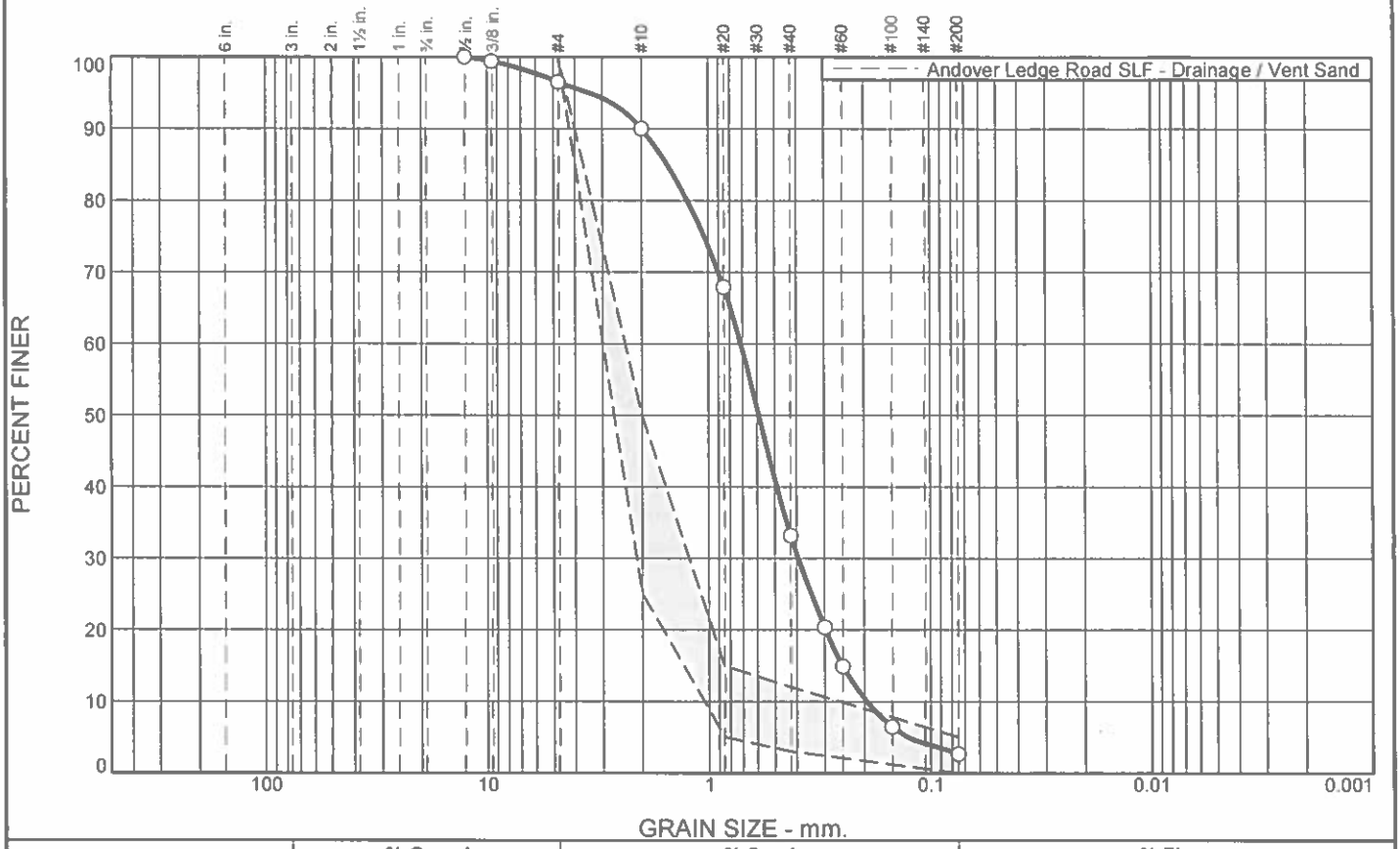
Should you have any questions or wish to discuss the above soil test results or attached gradation ("sieve") curve, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.5	6.5	56.8	30.5	2.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	99.4		
#4	96.5	100	X
#10	90.0	25-50	X
#20	67.9	5-15	X
#40	33.2	3-12	X
#50	20.4		
#60	14.9		
#100	6.5		
#200	2.7	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace gravel trace silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.5336 D_{60}= 0.7122 D_{50}= 0.5900
D_{30}= 0.3934 D_{15}= 0.2509 D_{10}= 0.1948
C_u= 3.66 C_c= 1.12

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample was submitted by client on 10/03/24
Did not meet "Sand" gradation limits

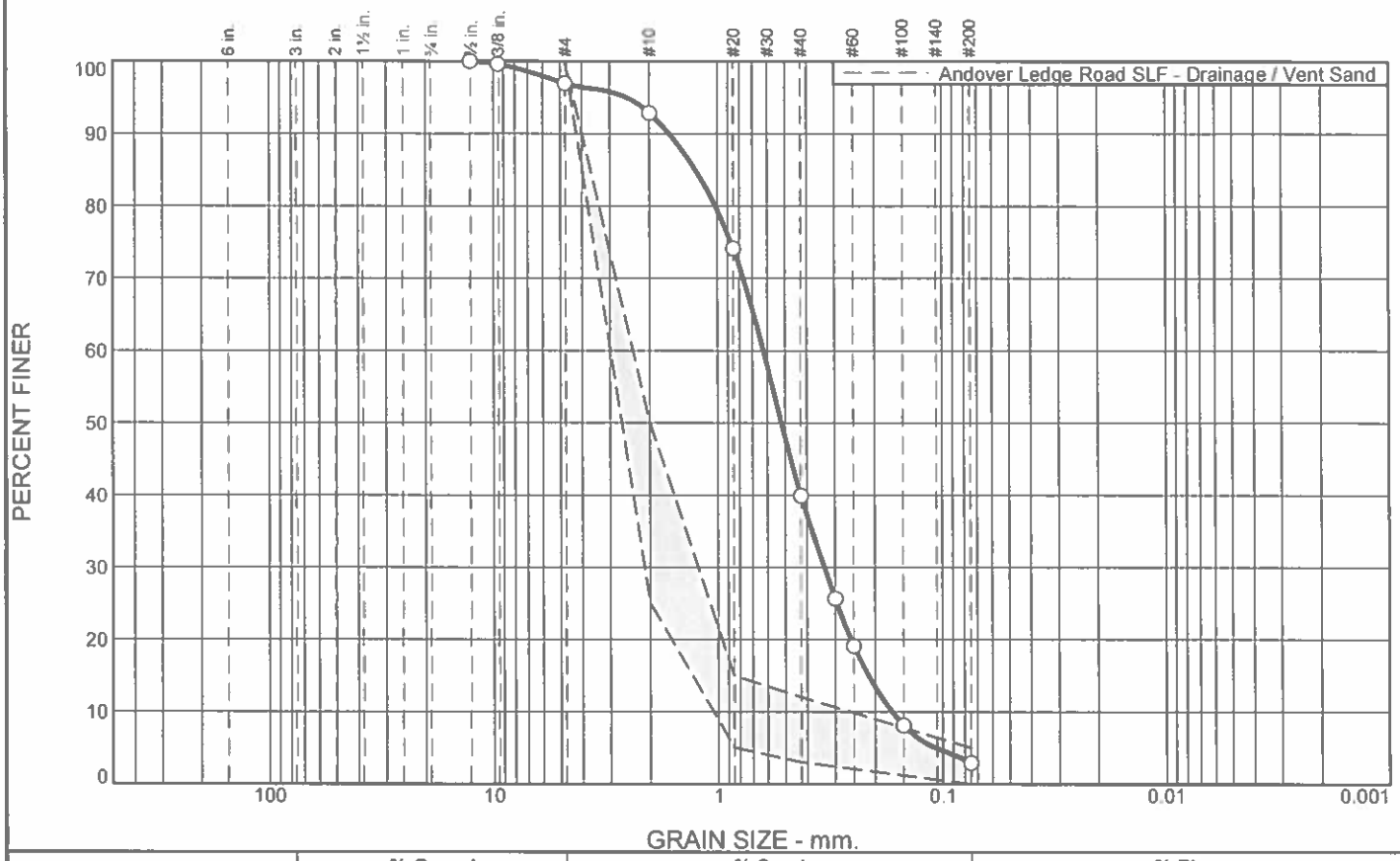
Sample No.: L35340 **Source of Sample:** Andover SLF **Date:** 10/8/24
Location: DPW Materials - Coarse Sand **Elev./Depth:** 39000 cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.0	4.2	52.9	37.0	2.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	99.6		
#4	97.0	100	X
#10	92.8	25-50	X
#20	74.1	5-15	X
#40	39.9	3-12	X
#50	25.7		
#60	19.1		
#100	8.1		
#200	2.9	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace gravel trace silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.2521 D_{60}= 0.6260 D_{50}= 0.5201
D_{30}= 0.3355 D_{15}= 0.2142 D_{10}= 0.1686
C_u= 3.71 C_c= 1.07

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample was submitted by client on 10/03/24
Did not meet "Sand" gradation limits

Sample No.: L35341 **Source of Sample:** Andover SLF **Date:** 10/8/24
Location: DPW Materials - Coarse Sand **Elev./Depth:** 40500 cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

October 8, 2024

Mr. John Bates
J. Bates & Son, LLC
57 Lawrence Street
Clinton MA 01510

RE: Soil & Permeability Test Results
Andover Ledge Rd SLF
Andover, NH **Project # 26023**

Dear Mr. Bates:

Presented herein are the results of laboratory testing on a sample SP tan m/f sand trace gravel trace silt (**#L-35342**), submitted on October 3, 2024. Testing consisted of a one-point constant head permeability test (ASTM D-2434).

The permeability specimen was then prepared by compacting a calculated quantity of soil into a 1/30 cubic foot rigid mold. The test conditions and results are summarized on the Table below:

 # L-35342 – Sand 42000 cy
USCS Soil Classification = SP tan m/f sand trace gravel trace silt

Estimated Compaction (%)	Permeability (cm/sec)
90	**1.8×10^{-2}**

As can be seen above, the soil in question showed a permeability of 1.8×10^{-2} when compacted to approximately 90%, which met both "Coarse Gas Venting" layer specification of 1×10^{-3} cm/sec and "Drainage" layer specification 1.2×10^{-2} However, it should be noted that the permeability of cohesionless soils is inversely related to the degree of compaction but independent of the compacted moisture content.

Should you have any questions or wish to discuss the above soil test results or attached gradation ("sieve") curve, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
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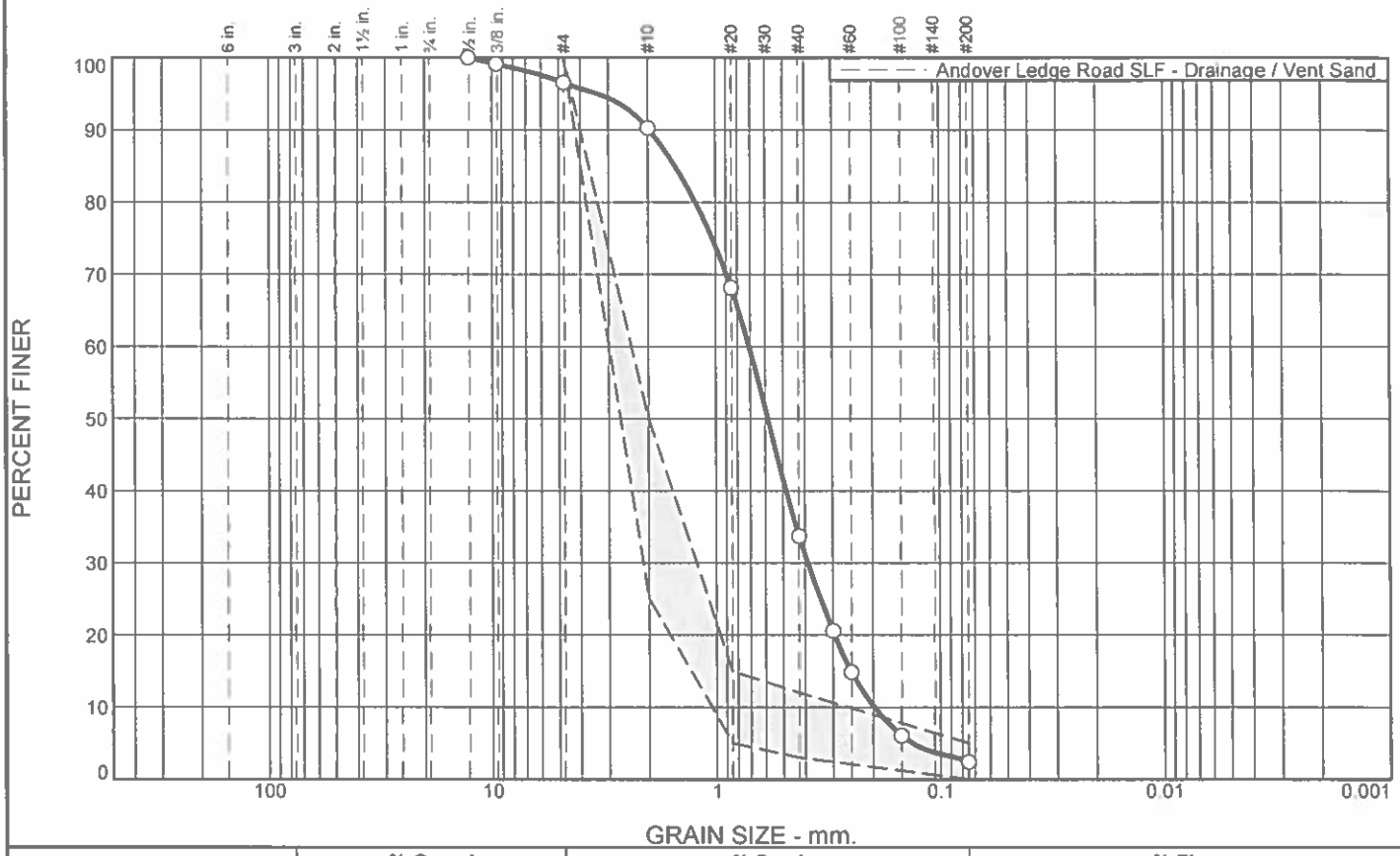
Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.4	6.3	56.6	31.3	2.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	99.1		
#4	96.6	100	X
#10	90.3	25-50	X
#20	68.1	5-15	X
#40	33.7	3-12	X
#50	20.6		
#60	14.9		
#100	6.1		
#200	2.4	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace gravel trace silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.5164 D_{60}= 0.7074 D_{50}= 0.5851
D_{30}= 0.3886 D_{15}= 0.2514 D_{10}= 0.1979
C_u= 3.57 C_c= 1.08

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample was submitted by client on 10/03/24
Did not meet "Sand" gradation limits

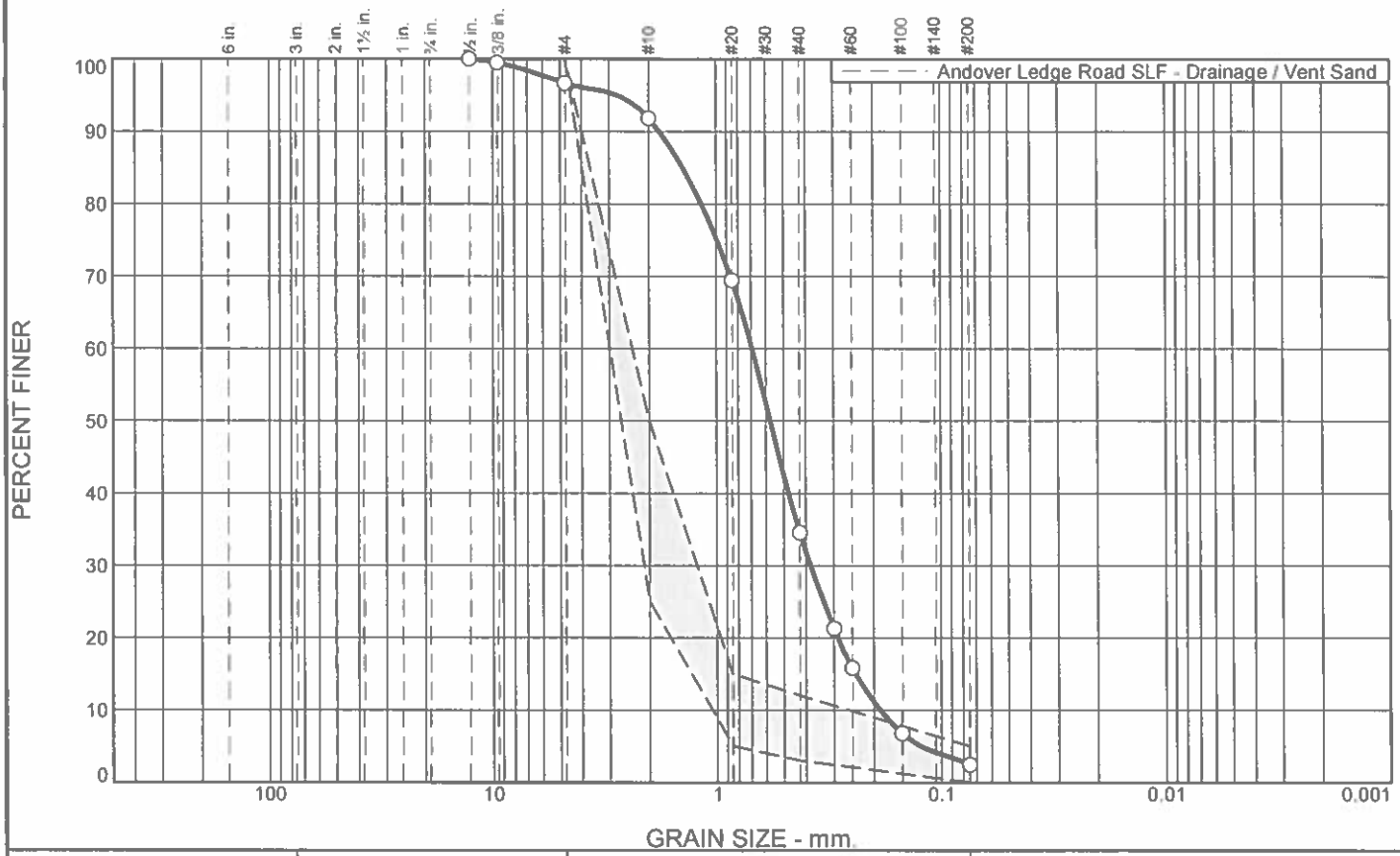
Sample No.: L35342 **Source of Sample:** Andover SLF **Date:** 10/8/24
Location: DPW Materials - Coarse Sand **Elev./Depth:** 42000 cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.3	4.9	57.3	32.1	2.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	99.5		
#4	96.7	100	X
#10	91.8	25-50	X
#20	69.4	5-15	X
#40	34.5	3-12	X
#50	21.3		
#60	15.8		
#100	6.8		
#200	2.4	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace gravel trace silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.4126 D_{60}= 0.6915 D_{50}= 0.5743
D_{30}= 0.3813 D_{15}= 0.2414 D_{10}= 0.1876
C_u= 3.68 C_c= 1.12

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample was submitted by client on 10/03/24
Did not meet "Sand" gradation limits

Sample No.: L35343 **Source of Sample:** Andover SLF **Date:** 10/8/24
Location: DPW Materials - Coarse Sand **Elev./Depth:** 43500 cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

October 8, 2024

Mr. John Bates
J. Bates & Son, LLC
57 Lawrence Street
Clinton MA 01510

RE: Soil & Permeability Test Results
Andover Ledge Rd SLF
Andover, NH **Project # 26023**

Dear Mr. Bates:

Presented herein are the results of laboratory testing on a sample SP tan m/f sand trace gravel trace silt (**#L-35344**), submitted on October 3, 2024. Testing consisted of a one-point constant head permeability test (ASTM D-2434).

The permeability specimen was then prepared by compacting a calculated quantity of soil into a 1/30 cubic foot rigid mold. The test conditions and results are summarized on the Table below:

 # L-35344 – Sand 45000 cy
USCS Soil Classification = SP tan m/f sand trace gravel trace silt

Estimated Compaction (%)	Permeability (cm/sec)
90	**1.5×10^{-2}**

As can be seen above, the soil in question showed a permeability of 1.5×10^{-2} when compacted to approximately 90%, which met both "Coarse Gas Venting" layer specification of 1×10^{-3} cm/sec and "Drainage" layer specification 1.2×10^{-2} However, it should be noted that the permeability of cohesionless soils is inversely related to the degree of compaction but independent of the compacted moisture content.

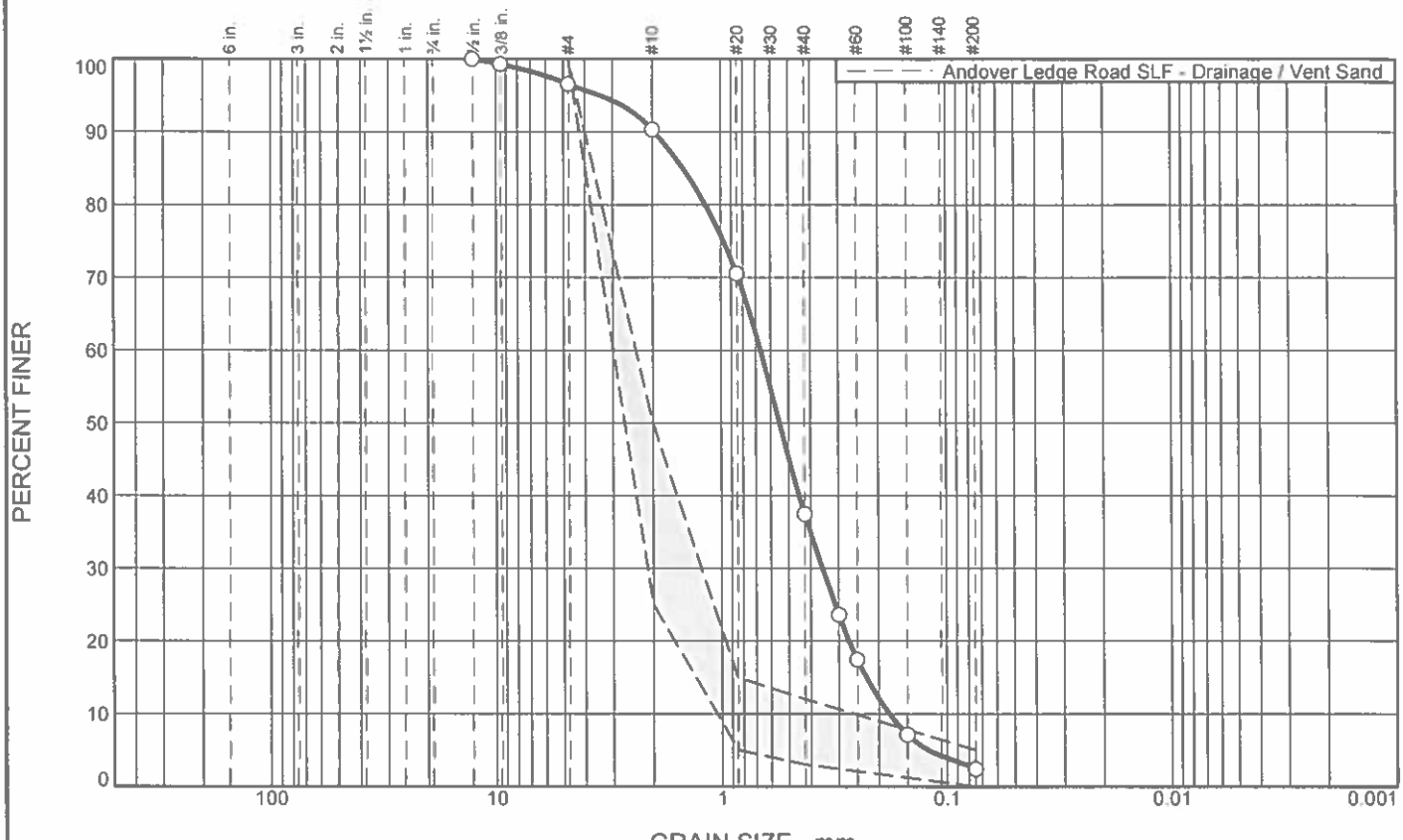
Should you have any questions or wish to discuss the above soil test results or attached gradation ("sieve") curve, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.4	6.3	52.8	35.1	2.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	99.3		
#4	96.6	100	X
#10	90.3	25-50	X
#20	70.5	5-15	X
#40	37.5	3-12	X
#50	23.6		
#60	17.5		
#100	7.1		
#200	2.4	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace gravel trace silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.4649 D_{60}= 0.6670 D_{50}= 0.5490
D_{30}= 0.3548 D_{15}= 0.2273 D_{10}= 0.1800
C_u= 3.71 C_c= 1.05

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample was submitted by client on 10/03/24
Did not meet "Sand" gradation limits

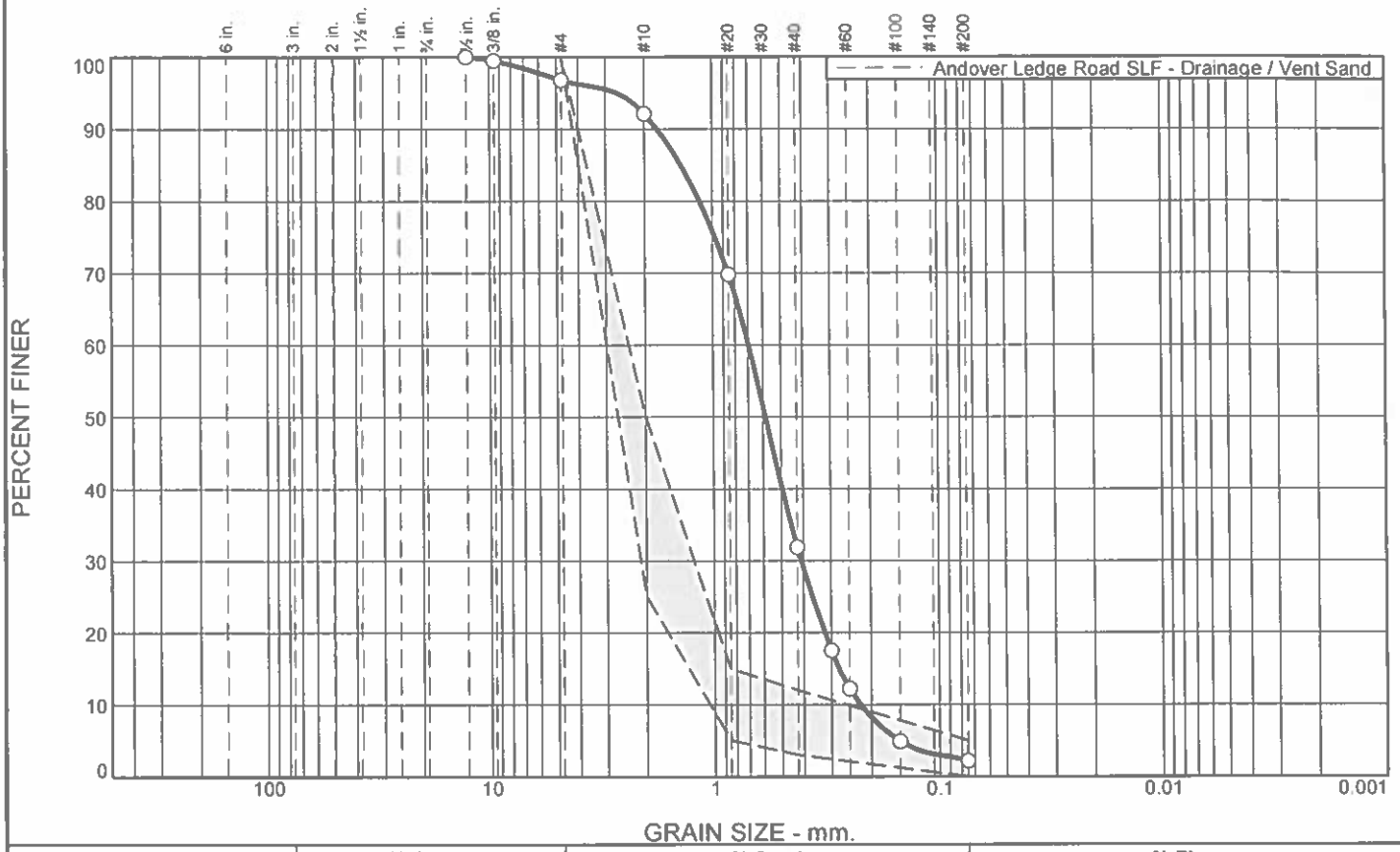
Sample No.: L35344 **Source of Sample:** Andover SLF **Date:** 10/8/24
Location: DPW Materials - Coarse Sand **Elev./Depth:** 45000 cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.2	4.7	60.2	29.7	2.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1/2"	100.0		
3/8"	99.5		
#4	96.8	100	X
#10	92.1	25-50	X
#20	69.8	5-15	X
#40	31.9	3-12	X
#50	17.6		
#60	12.2		
#100	4.9		
#200	2.2	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace gravel trace silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.3801 D_{60}= 0.6956 D_{50}= 0.5863
D_{30}= 0.4083 D_{15}= 0.2777 D_{10}= 0.2235
C_u= 3.11 C_c= 1.07

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample submitted by client on 10/29/24
Did not meet project "sand" gradation limits

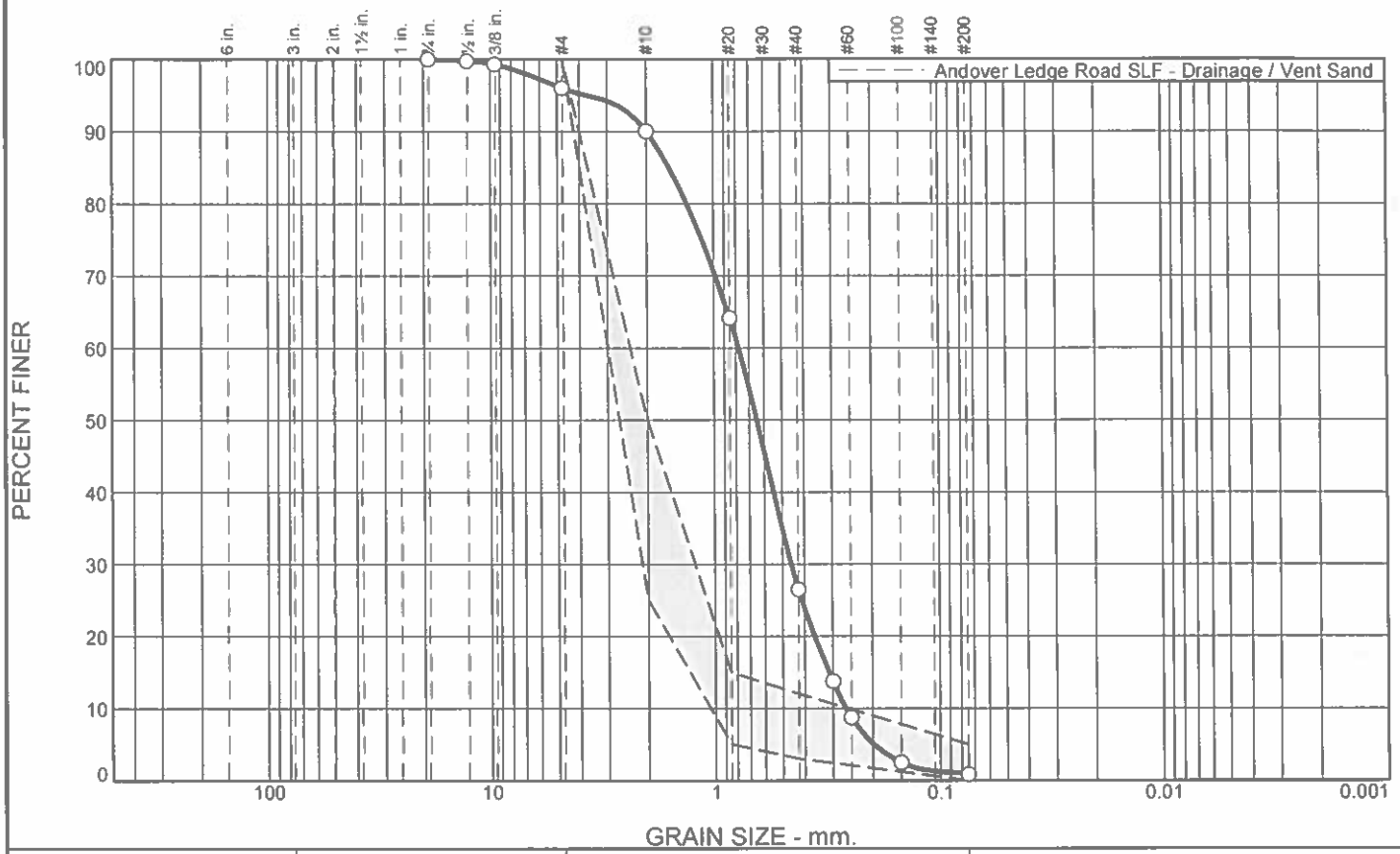
Sample No.: L-35524 **Source of Sample:** Andover SLF **Date:** 11/5/24
Location: Drainage/Vent Sand **Elev./Depth:** 46.500 cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	4.0	6.0	63.5	25.6	0.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	99.8		
3/8"	99.3		
#4	96.0	100	X
#10	90.0	25-50	X
#20	64.1	5-15	X
#40	26.5	3-12	X
#50	13.8		
#60	8.7		
#100	2.5		
#200	0.9	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace gravel trace silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.5867 D_{60}= 0.7771 D_{50}= 0.6476
D_{30}= 0.4569 D_{15}= 0.3118 D_{10}= 0.2642
C_u= 2.94 C_c= 1.02

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample submitted by client on 10/29/24
Did not meet project "sand" gradation limits

Sample No.: L-35525 **Source of Sample:** Andover SLF **Date:** 11/5/24
Location: Drainage/Vent Sand **Elev./Depth:** 48.000 cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

November 8, 2024

Mr. John Bates
J. Bates & Son, LLC
57 Lawrence Street
Clinton MA 01510

RE: Soil & Permeability Test Results
Andover Ledge Rd SLF
Andover, NH **Project # 26023**

Dear Mr. Bates:

Presented herein are the results of laboratory testing on a sample SP tan m/f sand trace gravel trace silt (**#L-35525**), submitted on October 29, 2024. Testing consisted of a one-point constant head permeability test (ASTM D-2434).

The permeability specimen was then prepared by compacting a calculated quantity of soil into a 1/30 cubic foot rigid mold. The test conditions and results are summarized on the Table below:

 # L-35525 – Sand 48,000 cy
USCS Soil Classification = SP tan m/f sand trace gravel trace silt

Estimated Compaction (%)	Permeability (cm/sec)
90	**3.9×10^{-2}**

As can be seen above, the soil in question showed a permeability of 1.5×10^{-2} when compacted to approximately 90%, which met "Coarse Gas Venting" layer specification of 1×10^{-3} cm/sec. However, it should be noted that the permeability of cohesionless soils is inversely related to the degree of compaction but independent of the compacted moisture content.

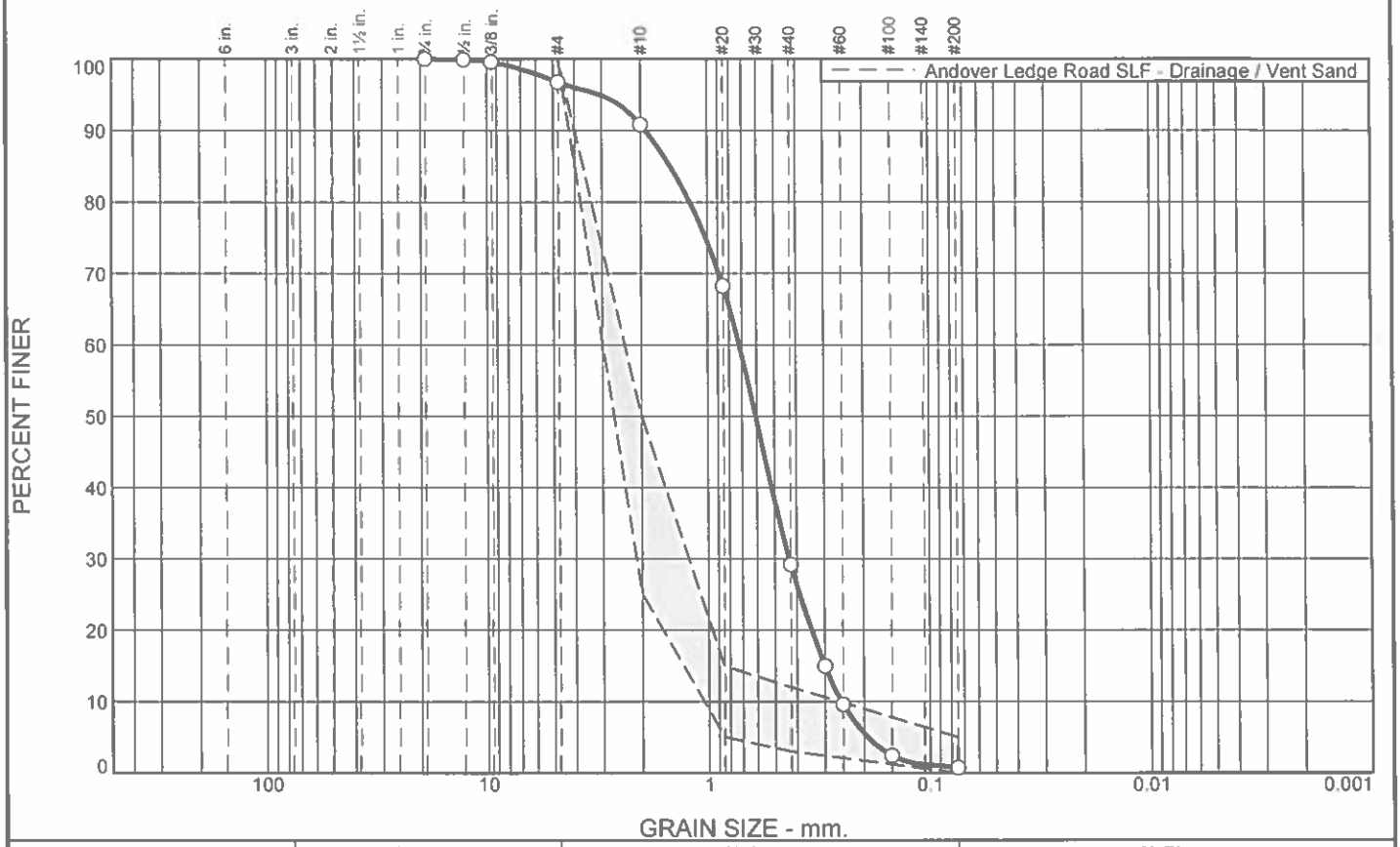
Should you have any questions or wish to discuss the above soil test results or attached gradation ("sieve") curve, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.2	6.0	61.6	28.5	0.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	99.9		
3/8"	99.6		
#4	96.8	100	X
#10	90.8	25-50	X
#20	68.2	5-15	X
#40	29.2	3-12	X
#50	15.0		
#60	9.6		
#100	2.4		
#200	0.7	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace gravel trace silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.4701 D_{60}= 0.7188 D_{50}= 0.6074
D_{30}= 0.4319 D_{15}= 0.3002 D_{10}= 0.2541
C_u= 2.83 C_c= 1.02

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample submitted by client on 10/29/24
Did not meet project "sand" gradation limits

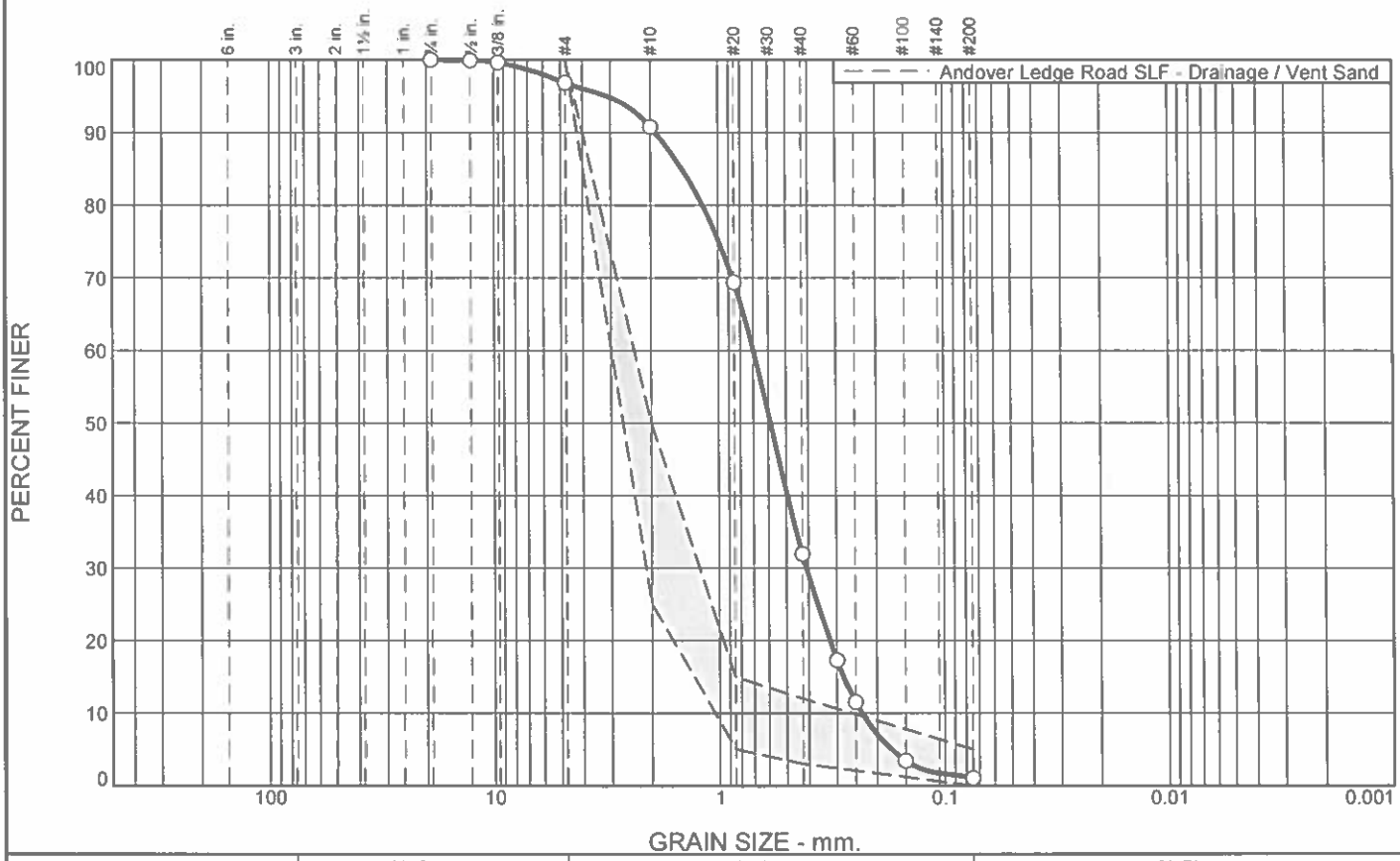
Sample No.: L-35526 **Source of Sample:** Andover SLF **Date:** 11/5/24
Location: Drainage/Vent Sand **Elev./Depth:** 49.500 cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.2	6.0	58.8	31.0	1.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	99.9		
3/8"	99.6		
#4	96.8	100	X
#10	90.8	25-50	X
#20	69.4	5-15	X
#40	32.0	3-12	X
#50	17.3		
#60	11.5		
#100	3.4		
#200	1.0	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace gravel trace silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.4529 D_{60}= 0.6986 D_{50}= 0.5869
D_{30}= 0.4076 D_{15}= 0.2812 D_{10}= 0.2338
C_u= 2.99 C_c= 1.02

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample submitted by client on 10/29/24
Did not meet project "sand" gradation limits

Sample No.: L-35527 **Source of Sample:** Andover SLF **Date:** 11/5/24
Location: Drainage/Vent Sand **Elev./Depth:** 51.000 cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

November 8, 2024

Mr. John Bates
J. Bates & Son, LLC
57 Lawrence Street
Clinton MA 01510

RE: Soil & Permeability Test Results
Andover Ledge Rd SLF
Andover, NH **Project # 26023**

Dear Mr. Bates:

Presented herein are the results of laboratory testing on a sample SP tan m/f sand trace gravel trace silt (**#L-35527**), submitted on October 29, 2024. Testing consisted of a one-point constant head permeability test (ASTM D-2434).

The permeability specimen was then prepared by compacting a calculated quantity of soil into a 1/30 cubic foot rigid mold. The test conditions and results are summarized on the Table below:

 # L-35527 – Sand 51,000 cy
USCS Soil Classification = SP tan m/f sand trace gravel trace silt

Estimated Compaction (%)	Permeability (cm/sec)
90	**3.5×10^{-2}**

As can be seen above, the soil in question showed a permeability of 1.5×10^{-2} when compacted to approximately 90%, which met "Coarse Gas Venting" layer specification of 1×10^{-3} cm/sec. However, it should be noted that the permeability of cohesionless soils is inversely related to the degree of compaction but independent of the compacted moisture content.

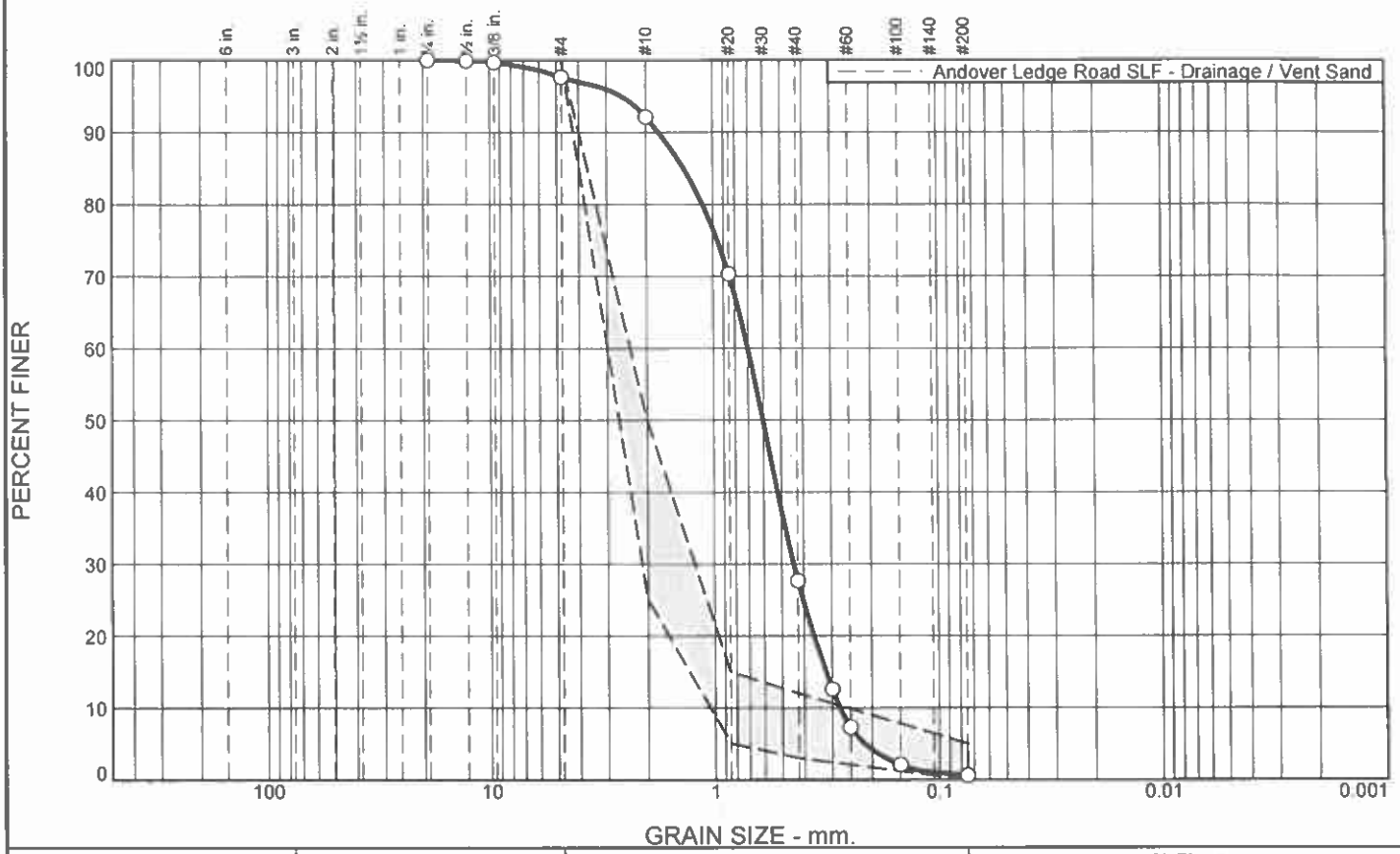
Should you have any questions or wish to discuss the above soil test results or attached gradation ("sieve") curve, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.3	5.6	64.4	27.1	0.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	99.9		
3/8"	99.7		
#4	97.7	100	X
#10	92.1	25-50	X
#20	70.3	5-15	X
#40	27.7	3-12	X
#50	12.6		
#60	7.3		
#100	2.1		
#200	0.6	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace gravel trace silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.3545 D_{60}= 0.7022 D_{50}= 0.6033
D_{30}= 0.4436 D_{15}= 0.3201 D_{10}= 0.2777
C_u= 2.53 C_c= 1.01

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample submitted by client on 10/29/24
Did not meet project "sand" gradation limits

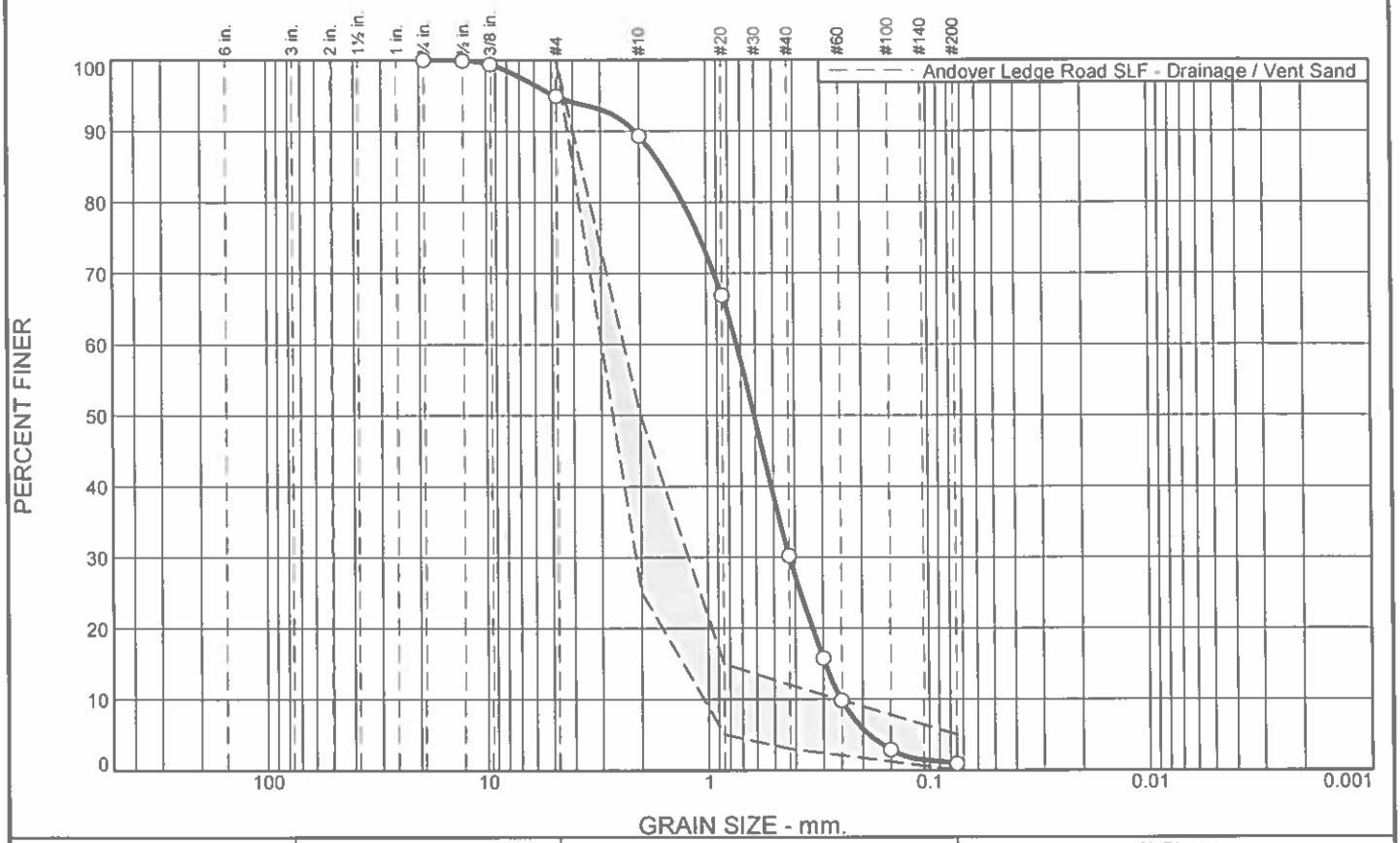
Sample No.: L-35528 **Source of Sample:** Andover SLF **Date:** 11/5/24
Location: Drainage/Vent Sand **Elev./Depth:** 52.500 cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	5.1	5.6	59.1	29.3	0.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	99.9		
3/8"	99.4		
#4	94.9	100	X
#10	89.3	25-50	X
#20	66.9	5-15	X
#40	30.2	3-12	X
#50	15.8		
#60	9.8		
#100	2.9		
#200	0.9	0-5	

* Andover Ledge Road SLF - Drainage / Vent Sand

Material Description

Tan m/f sand trace gravel trace silt

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.5816 D_{60}= 0.7312 D_{50}= 0.6094
D_{30}= 0.4231 D_{15}= 0.2939 D_{10}= 0.2519
C_u= 2.90 C_c= 0.97

Classification

USCS= SP AASHTO= A-1-b

Remarks

Sample submitted by client on 10/29/24
Did not meet project "sand" gradation limits

Sample No.: L-35529 **Source of Sample:** Andover SLF **Date:** 11/5/24
Location: Drainage/Vent Sand **Elev./Depth:** 54.000 cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

November 8, 2024

Mr. John Bates
J. Bates & Son, LLC
57 Lawrence Street
Clinton MA 01510

RE: Soil & Permeability Test Results
Andover Ledge Rd SLF
Andover, NH **Project # 26023**

Dear Mr. Bates:

Presented herein are the results of laboratory testing on a sample SP tan m/f sand trace gravel trace silt (**#L-35529**), submitted on October 29, 2024. Testing consisted of a one-point constant head permeability test (ASTM D-2434).

The permeability specimen was then prepared by compacting a calculated quantity of soil into a 1/30 cubic foot rigid mold. The test conditions and results are summarized on the Table below:

 # L-35529 – Sand 54,000 cy
USCS Soil Classification = SP tan m/f sand trace gravel trace silt

Estimated Compaction (%)	Permeability (cm/sec)
90	**3.5×10^{-2}**

As can be seen above, the soil in question showed a permeability of 1.5×10^{-2} when compacted to approximately 90%, which met "Coarse Gas Venting" layer specification of 1×10^{-3} cm/sec. However, it should be noted that the permeability of cohesionless soils is inversely related to the degree of compaction but independent of the compacted moisture content.

Should you have any questions or wish to discuss the above soil test results or attached gradation ("sieve") curve, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

Appendix G LLDPE Liner Test Results

Appendix G-1 Certificates of Analysis

Roll List

Customer: New England Liner Systems
Project: Ledge Road LF Closure Project
Destination: Andover, MA
Report Date: 13-May-2024 10:41 AM

S.O.# SO00021821
Item Number: FG-LDMSDS040BBBEG
Liner Type: LLDPE DS MicroSpike 40mil Black GM17
Roll Count: 72 (From 1 To 72) Total area 1,242,000 sf

#	Roll Number	Prod. Date	Width	Length	Area	Weight	Resin Lot#	3rd Party Conformance	Sample Size
1	GTD0134780001	04/27/24	23	750	17,250	3885	23HB567		
2	GTD0134780002	04/27/24	23	750	17,250	3865	23HB567		
3	GTD0134780003	04/27/24	23	750	17,250	3865	23HB567		
4	GTD0134780004	04/27/24	23	750	17,250	3865	23HB567		
5	GTD0134780005	04/27/24	23	750	17,250	3860	23HB567		
6	GTD0134780006	04/27/24	23	750	17,250	3860	23HB567		
7	GTD0134780007	04/27/24	23	750	17,250	3855	23HB567		
8	GTD0134780008	04/27/24	23	750	17,250	3845	23HB567		
9	GTD0134780009	04/28/24	23	750	17,250	3850	23HB567		
10	GTD0134780010	04/28/24	23	750	17,250	3870	23HB567		
11	GTD0134780011	04/28/24	23	750	17,250	3850	23HB567		
12	GTD0134780012	04/28/24	23	750	17,250	3880	23HB567		
13	GTD0134780013	04/28/24	23	750	17,250	3865	23HB567		
14	GTD0134780015	04/28/24	23	750	17,250	3855	23HB567		
15	GTD0134780016	04/28/24	23	750	17,250	3860	23HB567		
16	GTD0134780017	04/28/24	23	750	17,250	3850	23HB567		
17	GTD0134780018	04/28/24	23	750	17,250	3855	23HB567		
18	GTD0134780019	04/29/24	23	750	17,250	3860	23HB567		
19	GTD0134780020	04/29/24	23	750	17,250	3855	23HB567		
20	GTD0134780021	04/29/24	23	750	17,250	3865	23HB567		
21	GTD0134780022	04/29/24	23	750	17,250	3870	23HB567		
22	GTD0134780023	04/29/24	23	750	17,250	3870	23HB567		
23	GTD0134780024	04/29/24	23	750	17,250	3875	23HB567		
24	GTD0134780025	04/29/24	23	750	17,250	3880	23HB567		
25	GTD0134780026	04/29/24	23	750	17,250	3850	23HB567		
26	GTD0134780027	04/29/24	23	750	17,250	3860	23HB567		
27	GTD0134780028	04/30/24	23	750	17,250	3865	23HB567		
28	GTD0134780029	04/30/24	23	750	17,250	3855	23HB567		
29	GTD0134780030	04/30/24	23	750	17,250	3850	23HB567		
30	GTD0134780031	04/30/24	23	750	17,250	3865	23HB567		
31	GTD0134780032	04/30/24	23	750	17,250	3860	23HB567		
32	GTD0134780033	04/30/24	23	750	17,250	3865	23HB567		
33	GTD0134780034	04/30/24	23	750	17,250	3865	23HB567		
34	GTD0134780035	04/30/24	23	750	17,250	3855	23HB567		
35	GTD0134780036	04/30/24	23	750	17,250	3855	23HB567		
36	GTD0134780037	04/30/24	23	750	17,250	3845	23HB567		
37	GTD0134780038	05/01/24	23	750	17,250	3850	23HB567		
38	GTD0134780040	05/01/24	23	750	17,250	3860	23HB567		
39	GTD0134780041	05/01/24	23	750	17,250	3860	23HB567		
40	GTD0134780042	05/01/24	23	750	17,250	3865	23HB567		
41	GTD0134780043	05/01/24	23	750	17,250	3860	23HB567		
42	GTD0134780044	05/01/24	23	750	17,250	3860	23HB567		
43	GTD0134780045	05/01/24	23	750	17,250	3860	23HB567		

#	Roll Number	Prod. Date	Width	Length	Area	Weight	Resin Lot#	3rd Party Conformance	Sample Size
44	GTD0134780046	05/01/24	23	750	17,250	3860	23HB567		
45	GTD0134780047	05/02/24	23	750	17,250	3870	23HB567		
46	GTD0134780048	05/02/24	23	750	17,250	3865	23HB567		
47	GTD0134780049	05/02/24	23	750	17,250	3860	23HB567		
48	GTD0134780050	05/02/24	23	750	17,250	3860	23HB567		
49	GTD0134780051	05/02/24	23	750	17,250	3845	23HB567		
50	GTD0134780052	05/02/24	23	750	17,250	3845	23HB567		
51	GTD0134780053	05/02/24	23	750	17,250	3860	23HB567		
52	GTD0134780054	05/02/24	23	750	17,250	3865	23HB567		
53	GTD0134780055	05/02/24	23	750	17,250	3870	23HB567		
54	GTD0134780056	05/03/24	23	750	17,250	3865	23HB567		
55	GTD0134780057	05/03/24	23	750	17,250	3850	23HB567		
56	GTD0134780058	05/03/24	23	750	17,250	3865	23HB567		
57	GTD0134780059	05/03/24	23	750	17,250	3860	23HB567		
58	GTD0134780060	05/03/24	23	750	17,250	3860	23HB567		
59	GTD0134780061	05/03/24	23	750	17,250	3865	23HB567		
60	GTD0134780062	05/03/24	23	750	17,250	3875	23HB567		
61	GTD0134780063	05/03/24	23	750	17,250	3850	23HB567		
62	GTD0134780064	05/03/24	23	750	17,250	3855	23HB567		
63	GTD0134780065	05/03/24	23	750	17,250	3860	23HB567		
64	GTD0134780066	05/04/24	23	750	17,250	3870	23HB567		
65	GTD0134780067	05/04/24	23	750	17,250	3855	23HB567		
66	GTD0134780068	05/04/24	23	750	17,250	3865	23HB567		
67	GTD0134780069	05/04/24	23	750	17,250	3865	23HB567		
68	GTD0134780070	05/04/24	23	750	17,250	3860	23HB567		
69	GTD0134780071	05/04/24	23	750	17,250	3865	23HB567		
70	GTD0134780072	05/04/24	23	750	17,250	3865	23HB567		
71	GTD0134780073	05/04/24	23	750	17,250	3855	23HB567		
72	GTD0134780074	05/04/24	23	750	17,250	3860	23HB567		

Tom Nichols

Tom Nichols, Corporate Quality Director

For Questions, Please Contact:

Corporate Quality Director
Tom Nichols
843-546-0600
Ext 1063

Geomembrane Quality Certification

Customer: New England Liner Systems
Project: Ledge Road LF Closure Project
Destination: Andover, MA
Report Date: 13-May-2024 12:59 PM

S.O.# SO00021821
Item Number: FG-LDMSDS040BBBEG
Liner Type: LLDPE DS MicroSpike 40mil Black GM17
Roll Count: 72 (From 1 To 72)

								ASTM D5994		ASTM D7466		ASTM D8117	ASTM D792	ASTM D1238	ASTM D4218	ASTM D5596	ASTM D6693				ASTM D1004		ASTM D4833
#	Roll Number	Prod. Date	Width (ft)	Length (ft)	Area (sqft)	Weight (lb)	Resin Lot#	Thickness-Min	Thickness-Avg	Asperity (top)	Asperity (bottom)	OIT	Density	Melt Flow	Carbon Content	Category 1 Disp.	Tensile Break Str (MD)	Break Elong (MD)	Tensile Break Str (TD)	Break Elong (TD)	Tear Strength (MD)	Tear Strength (TD)	Puncture Resistance
								mil	mil	mil	mil	minute	g/cc	g/10	%	Categ	ppi	%	ppi	%	lb	lb	lb
1	GTD0134780001	04/27/24	23	750	17250	3885	23HB567	42	45	31	32	152	0.936	0.44	2.3	10	152	437	122	509	36	33	89
2	GTD0134780002	04/27/24	23	750	17250	3865	23HB567	38	40	33	34	152	0.936	0.44	2.3	10	152	437	122	509	36	33	89
3	GTD0134780003	04/27/24	23	750	17250	3865	23HB567	39	40	32	33	152	0.936	0.44	2.3	10	152	437	122	509	36	33	89
4	GTD0134780004	04/27/24	23	750	17250	3865	23HB567	39	41	32	33	152	0.936	0.44	2.3	10	152	437	122	509	36	33	89
5	GTD0134780005	04/27/24	23	750	17250	3860	23HB567	39	41	32	32	152	0.936	0.44	2.3	10	152	437	122	509	36	33	89
6	GTD0134780006	04/27/24	23	750	17250	3860	23HB567	39	41	32	32	152	0.937	0.44	2.3	10	140	500	117	518	36	33	89
7	GTD0134780007	04/27/24	23	750	17250	3855	23HB567	39	41	32	32	152	0.937	0.44	2.3	10	140	500	117	518	36	33	89
8	GTD0134780008	04/27/24	23	750	17250	3845	23HB567	40	42	32	32	152	0.937	0.44	2.4	10	140	500	117	518	36	33	89
9	GTD0134780009	04/28/24	23	750	17250	3850	23HB567	40	43	32	32	152	0.937	0.44	2.4	10	140	500	117	518	36	33	89
10	GTD0134780010	04/28/24	23	750	17250	3870	23HB567	40	42	31	32	152	0.937	0.44	2.3	10	140	500	117	518	36	33	89
11	GTD0134780011	04/28/24	23	750	17250	3850	23HB567	41	43	32	32	152	0.937	0.44	2.3	10	148	491	118	516	33	32	88
12	GTD0134780012	04/28/24	23	750	17250	3880	23HB567	40	42	32	32	152	0.937	0.44	2.3	10	148	491	118	516	33	32	88
13	GTD0134780013	04/28/24	23	750	17250	3865	23HB567	41	43	32	32	152	0.937	0.44	2.3	10	148	491	118	516	33	32	88
14	GTD0134780015	04/28/24	23	750	17250	3855	23HB567	41	43	32	32	152	0.937	0.44	2.3	10	148	491	118	516	33	32	88
15	GTD0134780016	04/28/24	23	750	17250	3860	23HB567	40	43	32	32	152	0.937	0.44	2.3	10	148	491	118	516	33	32	88
16	GTD0134780017	04/28/24	23	750	17250	3850	23HB567	41	43	31	34	152	0.937	0.44	2.4	10	151	520	117	501	33	32	88
17	GTD0134780018	04/28/24	23	750	17250	3855	23HB567	42	43	32	33	152	0.937	0.44	2.4	10	151	520	117	501	33	32	88
18	GTD0134780019	04/29/24	23	750	17250	3860	23HB567	40	43	34	35	152	0.937	0.44	2.4	10	151	520	117	501	33	32	88
19	GTD0134780020	04/29/24	23	750	17250	3855	23HB567	40	43	31	33	152	0.937	0.44	2.4	10	151	520	117	501	33	32	88
20	GTD0134780021	04/29/24	23	750	17250	3865	23HB567	41	43	32	33	152	0.937	0.44	2.4	10	151	520	117	501	33	32	88
21	GTD0134780022	04/29/24	23	750	17250	3870	23HB567	41	43	32	33	152	0.934	0.44	2.4	10	136	494	120	521	34	35	91
22	GTD0134780023	04/29/24	23	750	17250	3870	23HB567	39	42	31	31	152	0.934	0.44	2.4	10	136	494	120	521	34	35	91
23	GTD0134780024	04/29/24	23	750	17250	3875	23HB567	40	43	31	32	152	0.934	0.44	2.3	10	136	494	120	521	34	35	91
24	GTD0134780025	04/29/24	23	750	17250	3880	23HB567	40	43	31	33	152	0.934	0.44	2.3	10	136	494	120	521	34	35	91
25	GTD0134780026	04/29/24	23	750	17250	3850	23HB567	39	42	32	33	152	0.934	0.44	2.3	10	136	494	120	521	34	35	91
26	GTD0134780027	04/29/24	23	750	17250	3860	23HB567	38	41	34	34	152	0.937	0.44	2.2	10	152	456	150	575	34	35	91
27	GTD0134780028	04/30/24	23	750	17250	3865	23HB567	39	41	32	34	152	0.937	0.44	2.2	10	152	456	150	575	34	35	91
28	GTD0134780029	04/30/24	23	750	17250	3855	23HB567	41	42	33	34	152	0.937	0.44	2.2	10	152	456	150	575	34	35	91
29	GTD0134780030	04/30/24	23	750	17250	3850	23HB567	40	42	31	30	152	0.937	0.44	2.2	10	152	456	150	575	34	35	91
30	GTD0134780031	04/30/24	23	750	17250	3865	23HB567	40	43	31	32	152	0.937	0.44	2.2	10	152	456	150	575	34	35	91
31	GTD0134780032	04/30/24	23	750	17250	3860	23HB567	38	42	32	32	152	0.935	0.44	2.3	10	136	499	123	540	33	31	82
32	GTD0134780033	04/30/24	23	750	17250	3865	23HB567	40	43	32	33	152	0.935	0.44	2.3	10	136	499	123	540	33	31	82

#	Roll Number	Prod. Date	Width (ft)	Length (ft)	Area (sqft)	Weight (lb)	Resin Lot#	ASTM D5994		ASTM D7466		ASTM D8117	ASTM D792	ASTM D1238	ASTM D4218	ASTM D5596	ASTM D6693				ASTM D1004		ASTM D4833
								Thickness-Min	Thickness-Avg	Asperity (top)	Asperity (bottom)	OIT	Density	Melt Flow	Carbon Content	Category 1 Disp.	Tensile Break Str (MD)	Break Elong (MD)	Tensile Break Str (TD)	Break Elong (TD)	Tear Strength (MD)	Tear Strength (TD)	Puncture Resistance
								mil	mil	mil	mil	minute	g/cc	g/10	%	Categ	ppi	%	ppi	%	lb	lb	lb
33	GTD0134780034	04/30/24	23	750	17250	3865	23HB567	38	42	33	36	152	0.935	0.44	2.3	10	136	499	123	540	33	31	82
34	GTD0134780035	04/30/24	23	750	17250	3855	23HB567	38	42	36	38	152	0.935	0.44	2.3	10	136	499	123	540	33	31	82
35	GTD0134780036	04/30/24	23	750	17250	3855	23HB567	35	42	35	36	152	0.935	0.44	2.3	10	136	499	123	540	33	31	82
36	GTD0134780037	04/30/24	23	750	17250	3845	23HB567	39	41	31	32	152	0.930	0.44	2.1	10	179	480	149	540	33	31	82
37	GTD0134780038	05/01/24	23	750	17250	3850	23HB567	39	44	30	33	152	0.930	0.44	2.1	10	179	480	149	540	33	31	82
38	GTD0134780040	05/01/24	23	750	17250	3860	23HB567	39	41	32	33	152	0.930	0.44	2.1	10	179	480	149	540	33	31	82
39	GTD0134780041	05/01/24	23	750	17250	3860	23HB567	40	43	32	33	152	0.930	0.44	2.1	10	179	480	149	540	33	31	82
40	GTD0134780042	05/01/24	23	750	17250	3865	23HB567	40	43	33	33	152	0.930	0.44	2.3	10	119	452	126	543	33	34	92
41	GTD0134780043	05/01/24	23	750	17250	3860	23HB567	41	43	33	32	152	0.930	0.44	2.3	10	119	452	126	543	33	34	92
42	GTD0134780044	05/01/24	23	750	17250	3860	23HB567	41	42	34	36	152	0.930	0.44	2.3	10	119	452	126	543	33	34	92
43	GTD0134780045	05/01/24	23	750	17250	3860	23HB567	38	42	34	36	152	0.930	0.44	2.3	10	119	452	126	543	33	34	92
44	GTD0134780046	05/01/24	23	750	17250	3860	23HB567	41	44	28	28	152	0.930	0.44	2.3	10	119	452	126	543	33	34	92
45	GTD0134780047	05/02/24	23	750	17250	3870	23HB567	41	43	32	33	152	0.931	0.44	2.3	10	121	521	145	510	33	34	92
46	GTD0134780048	05/02/24	23	750	17250	3865	23HB567	42	43	31	31	152	0.931	0.44	2.3	10	121	521	145	510	33	34	92
47	GTD0134780049	05/02/24	23	750	17250	3860	23HB567	42	46	31	32	152	0.931	0.44	2.3	10	121	521	145	510	33	34	92
48	GTD0134780050	05/02/24	23	750	17250	3860	23HB567	42	44	31	31	152	0.931	0.44	2.3	10	121	521	145	510	33	34	92
49	GTD0134780051	05/02/24	23	750	17250	3845	23HB567	42	45	31	32	152	0.931	0.44	2.3	10	121	521	145	510	33	34	92
50	GTD0134780052	05/02/24	23	750	17250	3845	23HB567	42	45	32	32	152	0.937	0.44	2.3	10	149	506	123	563	33	30	91
51	GTD0134780053	05/02/24	23	750	17250	3860	23HB567	42	44	31	32	152	0.937	0.44	2.3	10	149	506	123	563	33	30	91
52	GTD0134780054	05/02/24	23	750	17250	3865	23HB567	40	42	31	32	152	0.937	0.44	2.3	10	149	506	123	563	33	30	91
53	GTD0134780055	05/02/24	23	750	17250	3870	23HB567	38	42	31	33	152	0.937	0.44	2.3	10	149	506	123	563	33	30	91
54	GTD0134780056	05/03/24	23	750	17250	3865	23HB567	38	43	31	33	152	0.937	0.44	2.2	10	149	506	123	563	33	30	91
55	GTD0134780057	05/03/24	23	750	17250	3850	23HB567	39	42	31	34	152	0.937	0.44	2.2	10	164	539	141	518	33	30	91
56	GTD0134780058	05/03/24	23	750	17250	3865	23HB567	39	42	32	33	152	0.937	0.44	2.2	10	164	539	141	518	33	30	91
57	GTD0134780059	05/03/24	23	750	17250	3860	23HB567	39	42	32	33	152	0.937	0.44	2.2	10	164	539	141	518	33	30	91
58	GTD0134780060	05/03/24	23	750	17250	3860	23HB567	40	42	32	33	152	0.937	0.44	2.2	10	164	539	141	518	33	30	91
59	GTD0134780061	05/03/24	23	750	17250	3865	23HB567	40	42	32	33	152	0.937	0.44	2.2	10	164	539	141	518	33	30	91
60	GTD0134780062	05/03/24	23	750	17250	3875	23HB567	40	42	32	33	152	0.938	0.44	2.3	10	135	545	113	524	31	32	93
61	GTD0134780063	05/03/24	23	750	17250	3850	23HB567	39	42	32	33	152	0.938	0.44	2.3	10	135	545	113	524	31	32	93
62	GTD0134780064	05/03/24	23	750	17250	3855	23HB567	40	42	32	33	152	0.938	0.44	2.3	10	135	545	113	524	31	32	93
63	GTD0134780065	05/03/24	23	750	17250	3860	23HB567	40	42	32	30	152	0.938	0.44	2.3	10	135	545	113	524	31	32	93
64	GTD0134780066	05/04/24	23	750	17250	3870	23HB567	39	43	32	33	152	0.938	0.44	2.3	10	135	545	113	524	31	32	93
65	GTD0134780067	05/04/24	23	750	17250	3855	23HB567	40	42	32	32	152	0.937	0.44	2.3	10	132	492	125	542	31	32	93
66	GTD0134780068	05/04/24	23	750	17250	3865	23HB567	40	44	33	33	152	0.937	0.44	2.3	10	132	492	125	542	31	32	93
67	GTD0134780069	05/04/24	23	750	17250	3865	23HB567	41	44	32	33	152	0.937	0.44	2.3	10	132	492	125	542	31	32	93
68	GTD0134780070	05/04/24	23	750	17250	3860	23HB567	41	44	33	33	152	0.937	0.44	2.3	10	132	492	125	542	31	32	93
69	GTD0134780071	05/04/24	23	750	17250	3865	23HB567	40	44	32	34	152	0.937	0.44	2.3	10	132	492	125	542	31	32	93
70	GTD0134780072	05/04/24	23	750	17250	3865	23HB567	41	44	33	34	152	0.937	0.44	2.3	10	132	492	114	528	31	33	89
71	GTD0134780073	05/04/24	23	750	17250	3855	23HB567	40	43	32	33	152	0.937	0.44	2.3	10	132	492	114	528	31	33	89
72	GTD0134780074	05/04/24	23	750	17250	3860	23HB567	41	43	33	33	152	0.937	0.44	2.3	10	132	492	114	528	31	33	89

Tom Nichols

Tom Nichols, Corporate Quality Director

For Questions, Please Contact:

Corporate Quality Director
Tom Nichols
843-546-0600
Ext 1063

Formosa Plastics

FORMOSA PLASTICS CORPORATION, TEXAS

201 FORMOSA DRIVE
PO BOX 700
POINT COMFORT TX 77978
PHONE:(888)FPCUSA3

Certificate of Analysis

(CONFIDENTIAL)

CUSTOMER:AGRU AMERICA
171 HWY 905

CONWAY SC 29526

PRODUCT :L91904B
RAILCAR GACX054645
CLEANING/INSPECTION NO: 054645080823

S/O NO : J39A151
CUSTOMER PO : PO 20726
DATE SHIPPED: 9/27/23
LOT NO : 23HB567
WEIGHT (LB) : 179,300.00
CUSTID:FT03888 SPIDM1

TEST ITEM	REFERENCE METHOD	TEST VALUE
Melt Index, g/10min	ASTM D1238	.46
Density, g/cm3	ASTM D1505	.9198

Linda Kao

QC SUPERVISOR: LINDA KAO

AGRU America, Inc.
500 Garrison Road
Georgetown, SC 29440
Phone: 1-843-546-0600

30 May, 2022

RE: Formosa Plastics UV Resistance & Oven Aging Test Results – GRI-GM13/17 Per-Formulation Testing

To Whom It May Concern,

The UV Resistance (ASTM D7238) and Oven Aging (ASTM D5721) test results from TRI Environmental dated May 6, 2021 and September 11, 2019 are applicable to all AGRU geomembrane produced utilizing either Formosa Plastics HL3721 HDPE or L91904B LLDPE resins (respectively). These results are in full compliance with the requirements of GRI-GM13 and GRI-GM17.

GRI GM 13 and GRI GM 17 require that UV Resistance and Oven Aging Testing be performed once per formulation. A formulation is described as a unique combination of virgin resin and carbon black. This testing is not specific to a particular thickness, surface characteristic or resin lot number, but rather describes properties intrinsic to the raw materials used to manufacture the finished product. Even though this testing is only required per formulation, we send samples of finished geomembrane to our resin supplier(s) periodically for testing to confirm continued compliance with standards.

Please do not hesitate to contact me directly via email at Ajohnson2@agruamerica.com or by phone at (843)-546-0600 ext. 1067 should you have any further questions or concerns.

Sincerely,

Anthony Johnson
Technical & Inside Sales East Region Geogroup
AGRU America

May 29, 2019
September 11, 2019 Updated - Added UV Resistance and Oven Aging results

Mail To:

Maria Coffey
Agru America, Inc.
500 Garrison Road
Georgetown SC 29440

email: mcoffey@agruamerica.com
ccemail: carnold@agruamerica.com

Bill To:

<= Same

Dear Ms. Coffey:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs.
TRI is pleased to submit this final report of the laboratory testing for the sample(s) listed below.

Project:	**19-005**
TRI Job Reference Number:	46979
Material(s) Tested:	One, Agru 40 mil Smooth LLDPE Geomembrane(s)
Test(s) Requested:	UV Resistance (ASTM D 7238/GRI GM 13) Oven Aging (ASTM D5721) Multi-axial Tensile (ASTM D 5617) 2% Secant Modulus (ASTM D 5323)

If you have any questions or require any additional information, please call us at 1-800-880-8378

Sincerely,

Mansukh Patel
Laboratory Manager
Geosynthetic Services Division

*Signature is on file

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

TRI ENVIRONMENTAL, INC.
9063 BEE CAVES RD. – AUSTIN, TX 78733 – USA | PH: 800.880.TEST OR 512.263.2101

GEOMEMBRANE TEST RESULTS
TRI Client: Agru America, Inc.
Project: 19-005

Material: Agru 40 mil Smooth LLDPE Geomembrane
Sample Identification: GTC0034530002
TRI Log #: 46979

UV Resistance (ASTM D 7238/GRI GM 13)

The resistance to degradation due to exposure to ultraviolet light and moisture was determined in accordance with GRI-GM11, Accelerated Weathering of Geomembranes Using a Fluorescent UVA Device. This standard covers the basic principles for using the QUV apparatus to accelerate the weathering of geomembranes using UVA bulbs and condensation. To comply with Specification GRI GM13, the sample was exposed to 1600 hours of UV exposure composed of 80 cycles of UA at 75 C for 20 hours followed by condensation at 60 C for 4 hours. The High Pressure Oxidative Induction Time (HPOIT) was evaluated before and after the exposure and results were as follows.

PARAMETER		MEAN	STD. DEV.	PERCENT RETAINED
HPOIT (minutes) - Baseline	913	**913**		
HPOIT (minutes) - After QUV Aging	844	**844**		92

Note: No surface cracking was observed.

Oven Aging (ASTM D5721)

The geomembrane was exposed to 90 days of elevated temperature exposure in an air oven maintained at 85°C ± 0.5°C in accordance with ASTM D 5721-95, Standard Practice for Air-Oven Aging of Polyolefin Geomembranes. Oxidative Induction Time (OIT) was tested after exposure and compared to values generated for unexposed material. The results are provided below.

			MEAN	STD. DEV.	PERCENT RETAINED
OIT (minutes) - Baseline	122	147	**134**		
OIT (minutes) - After Oven Aging	82	96	**89**		66
HPOIT (minutes) - Baseline	913		**913**		
HPOIT (minutes) - After Oven Aging	609		**609**		67

Note: No surface cracking was observed.

Multi-axial Tensile (ASTM D 5617)
Test Method A: Centerpoint Deflection Versus Pressure

				MEAN	STD. DEV.
Thickness (mils)	45	43	37	**41**	4
Maximum Stress (psi)	1694	1598	1747	**1679**	76
% Elongation @ Rupture (%)	73.2	72.4	59.5	**68.4**	7.7
Failure Description	TDT N-EF	MDT N-EF	H-CAT N-EF		

MDT	A tear in the machine direction.
TDT	A tear in the transverse direction.
H	Circular or elliptical hole in the specimen.
H-CAT	Circular or elliptical hole in an area where the material has significantly necked down or thinned. The large thinned area resembles a pupil of a cat eye.
N-EF	No edge failure

2% Secant Modulus (ASTM D 5323)

						MEAN	STD. DEV.
MD 2% Secant Modulus (psi)	30570	29016	27091	29410	28582	**28934**	1268
MD 2% Secant Modulus (ppi)	1366	1195	1067	1259	1158	**1209**	112
TD 2% Secant Modulus (psi)	32242	29664	34455	28383	29696	**30888**	2437
TD 2% Secant Modulus (ppi)	1393	1204	1316	1127	1238	**1256**	102

MD Machine Direction TD Transverse Direction

The testing herein is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

TRI ENVIRONMENTAL, INC.
9063 BEE CAVES RD. – AUSTIN, TX 78733 – USA | PH: 800.880.TEST OR 512.263.2101

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	gc
Test Date:	05/14/24	Checked By:	dln
Sample ID:	Roll #GTD0134780001		
Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Initial Tear Resistance of Plastic Film and Sheeting by ASTM D1004

constant rate of extension (CRE) tensile testing machine

Specimen Number	Machine Direction		Cross Machine Direction	
	Thickness, mil	Tear Resistance, lb	Thickness, mil	Tear Resistance, lb
1	38.9	32	41.0	40
2	39.2	38	40.5	40
3	39.2	36	39.3	32
4	39.2	34	38.6	30
5	39.9	36	39.2	36
6	40.2	41	40.4	29
7	38.9	33	38.4	36
8	42.0	33	40.7	34
9	39.4	32	41.1	33
10	40.1	40	39.9	32
Average	39.7	36	39.9	34
Standard Deviation	0.93	3.3	0.98	3.8

Comments:

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	gc
Test Date:	05/14/24	Checked By:	dln
Sample ID:	Roll #GTD0134780006		
Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Initial Tear Resistance of Plastic Film and Sheeting by ASTM D1004

constant rate of extension (CRE) tensile testing machine

Specimen Number	Machine Direction		Cross Machine Direction	
	Thickness, mil	Tear Resistance, lb	Thickness, mil	Tear Resistance, lb
1	54.7	41	53.6	43
2	49.4	45	56.0	51
3	48.6	47	50.2	38
4	50.0	43	56.3	44
5	56.8	49	59.8	58
6	57.0	51	64.0	50
7	56.6	53	59.4	60
8	52.8	45	56.8	43
9	49.6	41	56.7	42
10	55.6	45	52.6	50
Average	53.1	46	56.5	48
Standard Deviation	3.44	4.0	3.93	7.1

Comments:

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	gc
Test Date:	05/14/24	Checked By:	dln
Sample ID:	Roll #GTD0134780011		
Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Initial Tear Resistance of Plastic Film and Sheeting by ASTM D1004

constant rate of extension (CRE) tensile testing machine

Specimen Number	Machine Direction		Cross Machine Direction	
	Thickness, mil	Tear Resistance, lb	Thickness, mil	Tear Resistance, lb
1	41.7	34	42.0	34
2	43.0	33	38.3	32
3	39.6	37	37.7	36
4	37.9	31	36.1	36
5	41.8	36	40.2	27
6	38.7	29	40.3	29
7	40.1	35	37.3	31
8	46.4	35	39.3	37
9	40.7	30	40.5	32
10	39.8	32	39.5	37
Average	40.9	33	39.1	33
Standard Deviation	2.44	2.6	1.77	3.4

Comments:

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	gc
Test Date:	05/14/24	Checked By:	dln
Sample ID:	Roll #GTD0134780016		
Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Initial Tear Resistance of Plastic Film and Sheeting by ASTM D1004

constant rate of extension (CRE) tensile testing machine

Specimen Number	Machine Direction		Cross Machine Direction	
	Thickness, mil	Tear Resistance, lb	Thickness, mil	Tear Resistance, lb
1	41.5	34	41.4	27
2	41.3	38	41.8	34
3	39.1	33	39.9	29
4	38.1	31	38.9	27
5	38.6	34	40.9	29
6	40.4	33	40.0	33
7	37.9	27	37.9	33
8	40.6	31	41.3	36
9	39.7	31	42.7	35
10	40.1	29	41.1	36
Average	39.7	32	40.6	32
Standard Deviation	1.28	3.1	1.43	3.4

Comments:

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	gc
Test Date:	05/14/24	Checked By:	dln
Sample ID:	Roll #GTD0134780021		
Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Initial Tear Resistance of Plastic Film and Sheeting by ASTM D1004

constant rate of extension (CRE) tensile testing machine

Specimen Number	Machine Direction		Cross Machine Direction	
	Thickness, mil	Tear Resistance, lb	Thickness, mil	Tear Resistance, lb
1	42.3	36	40.5	38
2	45.6	32	39.9	33
3	41.6	31	39.6	28
4	39.9	32	38.6	34
5	38.1	31	39.9	30
6	35.7	35	37.2	28
7	39.3	32	38.1	35
8	40.1	25	39.3	36
9	40.0	34	40.7	39
10	43.5	35	42.8	32
Average	40.6	32	39.6	33
Standard Deviation	2.78	3.1	1.54	4.0

Comments:

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	gc
Test Date:	05/14/24	Checked By:	dln
Sample ID:	Roll #GTD0134780027		
Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Initial Tear Resistance of Plastic Film and Sheeting by ASTM D1004

constant rate of extension (CRE) tensile testing machine

Specimen Number	Machine Direction		Cross Machine Direction	
	Thickness, mil	Tear Resistance, lb	Thickness, mil	Tear Resistance, lb
1	42.3	35	42.1	33
2	42.1	36	41.2	28
3	40.3	38	43.0	38
4	39.1	30	38.9	29
5	39.2	35	36.3	38
6	39.7	36	40.3	35
7	39.1	31	39.5	36
8	38.0	30	38.3	37
9	40.8	32	39.6	37
10	43.1	32	46.8	34
Average	40.3	33	40.6	35
Standard Deviation	1.67	2.8	2.89	3.6

Comments:

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	gc
Test Date:	05/14/24	Checked By:	dln
Sample ID:	Roll #GTD0134780032		
Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Initial Tear Resistance of Plastic Film and Sheeting by ASTM D1004

constant rate of extension (CRE) tensile testing machine

Specimen Number	Machine Direction		Cross Machine Direction	
	Thickness, mil	Tear Resistance, lb	Thickness, mil	Tear Resistance, lb
1	40.8	39	40.7	31
2	39.5	39	39.2	40
3	39.2	34	40.0	34
4	38.1	33	39.7	29
5	41.0	34	42.5	32
6	39.8	35	37.7	35
7	39.3	34	36.6	35
8	39.2	36	39.0	35
9	39.8	35	40.3	37
10	39.7	35	38.9	30
Average	39.6	35	39.5	34
Standard Deviation	0.83	2.2	1.62	3.4

Comments:

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	gc
Test Date:	05/14/24	Checked By:	dln
Sample ID:	Roll #GTD0134780037		
Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Initial Tear Resistance of Plastic Film and Sheeting by ASTM D1004

constant rate of extension (CRE) tensile testing machine

Specimen Number	Machine Direction		Cross Machine Direction	
	Thickness, mil	Tear Resistance, lb	Thickness, mil	Tear Resistance, lb
1	42.7	33	40.4	37
2	41.5	31	42.1	30
3	39.7	35	40.1	31
4	39.6	32	40.1	36
5	40.7	34	38.7	32
6	40.5	33	38.5	35
7	39.7	31	39.2	32
8	38.1	34	39.6	37
9	41.9	41	42.4	38
10	41.5	39	42.6	38
Average	40.6	34	40.3	35
Standard Deviation	1.35	3.2	1.51	3.1

Comments:

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	gc
Test Date:	05/14/24	Checked By:	dln
Sample ID:	Roll #GTD0134780044		
Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Initial Tear Resistance of Plastic Film and Sheeting by ASTM D1004

constant rate of extension (CRE) tensile testing machine

Specimen Number	Machine Direction		Cross Machine Direction	
	Thickness, mil	Tear Resistance, lb	Thickness, mil	Tear Resistance, lb
1	41.1	34	39.9	29
2	40.4	34	41.1	31
3	38.7	33	39.8	30
4	40.6	40	38.4	30
5	40.3	41	40.6	37
6	40.0	29	38.3	36
7	38.8	33	38.1	30
8	38.6	31	37.7	28
9	43.1	37	41.8	32
10	42.1	35	40.7	40
Average	40.4	35	39.6	32
Standard Deviation	1.48	3.5	1.42	3.9

Comments:

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	gc
Test Date:	05/14/24	Checked By:	dln
Sample ID:	Roll #GTD0134780047		
Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Initial Tear Resistance of Plastic Film and Sheeting by ASTM D1004

constant rate of extension (CRE) tensile testing machine

Specimen Number	Machine Direction		Cross Machine Direction	
	Thickness, mil	Tear Resistance, lb	Thickness, mil	Tear Resistance, lb
1	40.2	38	42.2	33
2	42.3	36	41.1	32
3	41.2	38	41.0	33
4	41.1	35	38.3	37
5	37.7	28	9.5	28
6	38.8	32	39.8	33
7	38.6	33	39.4	35
8	40.5	36	39.6	27
9	40.1	37	40.4	32
10	41.2	33	40.0	31
Average	40.2	35	37.1	32
Standard Deviation	1.42	3.1	9.76	2.9

Comments:

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems
Project:	Ledge Road LF Cap
Project Location:	Andover, MA
GTX Project No.:	319059
Test Date:	05/15/24
Tested By:	est/gc
Checked By:	dln

Density of Plastics by the Density-Gradient Technique by ASTM D1505

Sample ID	Spec. #	Density, g/cm^3
Roll #GTD0134780001	1	0.9392
Black, 40 mil Agru microspike LLDPE geomembrane	2	0.9391
	3	0.9385
	AVG.	0.9389

Sample ID	Spec. #	Density, g/cm^3
Roll #GTD0134780006	1	0.9389
Black, 40 mil Agru microspike LLDPE geomembrane	2	0.9392
	3	0.9393
	AVG.	0.9392

Sample ID	Spec. #	Density, g/cm^3
Roll #GTD0134780011	1	0.9358
Black, 40 mil Agru microspike LLDPE geomembrane	2	0.9359
	3	0.9358
	AVG.	0.9358

Sample ID	Spec. #	Density, g/cm^3
Roll #GTD0134780016	1	0.9358
Black, 40 mil Agru microspike LLDPE geomembrane	2	0.9358
	3	0.9359
	AVG.	0.9358

Sample ID	Spec. #	Density, g/cm^3
Roll #GTD0134780021	1	0.9363
Black, 40 mil Agru microspike LLDPE geomembrane	2	0.9361
	3	0.9362
	AVG.	0.9362

Comments: Temperature: 23°C

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems
Project:	Ledge Road LF Cap
Project Location:	Andover, MA
GTX Project No.:	319059
Test Date:	05/15/24
Tested By:	est/gc
Checked By:	dln

Density of Plastics by the Density-Gradient Technique by ASTM D1505

Sample ID	Spec. #	Density, g/cm^3
Roll #GTD0134780027	1	0.9358
Black, 40 mil Agru microspike LLDPE geomembrane	2	0.9360
	3	0.9360
	AVG.	0.9359

Sample ID	Spec. #	Density, g/cm^3
Roll #GTD0134780032	1	0.9370
Black, 40 mil Agru microspike LLDPE geomembrane	2	0.9370
	3	0.9371
	AVG.	0.9370

Sample ID	Spec. #	Density, g/cm^3
Roll #GTD0134780037	1	0.9363
Black, 40 mil Agru microspike LLDPE geomembrane	2	0.9365
	3	0.9366
	AVG.	0.9365

Sample ID	Spec. #	Density, g/cm^3
Roll #GTD0134780044	1	0.9353
Black, 40 mil Agru microspike LLDPE geomembrane	2	0.9353
	3	0.9354
	AVG.	0.9353

Sample ID	Spec. #	Density, g/cm^3
Roll #GTD0134780047	1	0.9357
Black, 40 mil Agru microspike LLDPE geomembrane	2	0.9357
	3	0.9357
	AVG.	0.9357

Comments: Temperature: 23°C

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems	
Project Name:	Ledge Road LF Cap	
Project Location:	Andover, MA	
GTX #:	319059	Tested By: est
Test Date:	05/10/24	Checked By: dln

Determination of Carbon Black Content in Polyethylene Compounds By the Muffle-Furnace Technique by ASTM D4218

Sample ID	Specimen Number	Carbon Black, %
Roll #GTD0134780001	1	2.47
Black, 40 mil Agru microspike LLDPE geomembrane	2	2.48
	Average	2.48

Sample ID	Specimen Number	Carbon Black, %
Roll #GTD0134780006	1	2.49
Black, 40 mil Agru microspike LLDPE geomembrane	2	2.47
	Average	2.48

Sample ID	Specimen Number	Carbon Black, %
Roll #GTD0134780011	1	2.47
Black, 40 mil Agru microspike LLDPE geomembrane	2	2.48
	Average	2.47

Sample ID	Specimen Number	Carbon Black, %
Roll #GTD0134780016	1	2.45
Black, 40 mil Agru microspike LLDPE geomembrane	2	2.45
	Average	2.45

Sample ID	Specimen Number	Carbon Black, %
Roll #GTD0134780021	1	2.43
Black, 40 mil Agru microspike LLDPE geomembrane	2	2.46
	Average	2.45

Comments:

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems	
Project Name:	Ledge Road LF Cap	
Project Location:	Andover, MA	
GTX #:	319059	Tested By: est
Test Date:	05/10/24	Checked By: dln

Determination of Carbon Black Content in Polyethylene Compounds By the Muffle-Furnace Technique by ASTM D4218

Sample ID	Specimen Number	Carbon Black, %
Roll #GTD0134780027	1	2.40
Black, 40 mil Agru microspike LLDPE geomembrane	2	2.42
	Average	2.41

Sample ID	Specimen Number	Carbon Black, %
Roll #GTD0134780032	1	2.46
Black, 40 mil Agru microspike LLDPE geomembrane	2	2.48
	Average	2.47

Sample ID	Specimen Number	Carbon Black, %
Roll #GTD0134780037	1	2.46
Black, 40 mil Agru microspike LLDPE geomembrane	2	2.47
	Average	2.47

Sample ID	Specimen Number	Carbon Black, %
Roll #GTD0134780044	1	2.40
Black, 40 mil Agru microspike LLDPE geomembrane	2	2.39
	Average	2.40

Sample ID	Specimen Number	Carbon Black, %
Roll #GTD0134780047	1	2.45
Black, 40 mil Agru microspike LLDPE geomembrane	2	2.46
	Average	2.46

Comments:

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	est
Test Date:	05/13/24	Checked By:	dln

Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics by ASTM D5596

Sample ID	Specimen Number	Category Rating Random Field of View	
		R_f1	R_f2
Roll #GTD0134780001 Black, 40 mil Agru microspike LLDPE geomembrane	1	1	1
	2	1	1
	3	1	1
	4	1	1
	5	1	1
	Average	1	1
	Lowest Quality Observed	1	1

Sample ID	Specimen Number	Category Rating Random Field of View	
		R_f1	R_f2
Roll #GTD0134780006 Black, 40 mil Agru microspike LLDPE geomembrane	1	1	1
	2	1	1
	3	1	1
	4	1	1
	5	1	1
	Average	1	1
	Lowest Quality Observed	1	1

Sample ID	Specimen Number	Category Rating Random Field of View	
		R_f1	R_f2
Roll #GTD0134780011 Black, 40 mil Agru microspike LLDPE geomembrane	1	1	1
	2	1	1
	3	1	2
	4	1	1
	5	1	1
	Average	1	1
	Lowest Quality Observed	1	2

Sample ID	Specimen Number	Category Rating Random Field of View	
		R_f1	R_f2
Roll #GTD0134780016 Black, 40 mil Agru microspike LLDPE geomembrane	1	1	1
	2	1	1
	3	1	1
	4	1	1
	5	1	1
	Average	1	1
	Lowest Quality Observed	1	1

Comments: Method of preparation: Microtome

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	est
Test Date:	05/13/24	Checked By:	dln

Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics by ASTM D5596

Sample ID	Specimen Number	Category Rating Random Field of View	
		R_f1	R_f2
Roll #GTD0134780021 Black, 40 mil Agru microspike LLDPE geomembrane	1	1	1
	2	1	1
	3	1	1
	4	1	1
	5	1	2
	Average	1	1
	Lowest Quality Observed	1	2

Sample ID	Specimen Number	Category Rating Random Field of View	
		R_f1	R_f2
Roll #GTD0134780027 Black, 40 mil Agru microspike LLDPE geomembrane	1	1	1
	2	1	1
	3	1	1
	4	1	1
	5	1	1
	Average	1	1
	Lowest Quality Observed	1	1

Sample ID	Specimen Number	Category Rating Random Field of View	
		R_f1	R_f2
Roll #GTD0134780032 Black, 40 mil Agru microspike LLDPE geomembrane	1	1	1
	2	1	1
	3	1	1
	4	1	1
	5	1	1
	Average	1	1
	Lowest Quality Observed	1	1

Comments: Method of preparation: Microtome

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	est
Test Date:	05/13/24	Checked By:	dln

Microscopic Evaluation of the Dispersion of Carbon Black in Polyolefin Geosynthetics by ASTM D5596

Sample ID	Specimen Number	Category Rating Random Field of View	
		R_f1	R_f2
Roll #GTD0134780037 Black, 40 mil Agru microspike LLDPE geomembrane	1	1	1
	2	1	1
	3	1	1
	4	1	1
	5	1	1
	Average	1	1
	Lowest Quality Observed	1	1

Sample ID	Specimen Number	Category Rating Random Field of View	
		R_f1	R_f2
Roll #GTD0134780044 Black, 40 mil Agru microspike LLDPE geomembrane	1	1	1
	2	1	1
	3	1	1
	4	1	1
	5	1	1
	Average	1	1
	Lowest Quality Observed	1	1

Sample ID	Specimen Number	Category Rating Random Field of View	
		R_f1	R_f2
Roll #GTD0134780047 Black, 40 mil Agru microspike LLDPE geomembrane	1	1	1
	2	1	1
	3	1	1
	4	1	1
	5	1	1
	Average	1	1
	Lowest Quality Observed	1	1

Comments: Method of preparation: Microtome

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	gc
Test Date:	05/14/24	Checked By:	dln
Sample ID:	Roll #GTD0134780001		
Sample Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Measurement of the Core Thickness of Textured Geomembranes by ASTM D5994

Testing Machine:	Mitutoyo Digimatic Indicator, Model #: ID-C112EX	Pressure:	2.0 oz
Presser Foot:	cone point	Loading Time:	5 seconds
Specimen Size:	2-inch-diameter		

Measurement Number	Thickness, mils
1	40
2	42
3	39
4	39
5	38
6	43
7	40
8	41
9	41
10	40
Average	40
Standard Deviation	1.4
Coefficient of Variation, %	3.4

Comments:

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	gc
Test Date:	05/14/24	Checked By:	dln
Sample ID:	Roll #GTD0134780006		
Sample Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Measurement of the Core Thickness of Textured Geomembranes by ASTM D5994

Testing Machine:	Mitutoyo Digimatic Indicator, Model #: ID-C112EX	Pressure:	2.0 oz
Presser Foot:	cone point	Loading Time:	5 seconds
Specimen Size:	2-inch-diameter		

Measurement Number	Thickness, mils
1	54
2	52
3	50
4	55
5	55
6	58
7	58
8	53
9	51
10	51
Average	54
Standard Deviation	2.6
Coefficient of Variation, %	4.9

Comments:

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	gc
Test Date:	05/14/24	Checked By:	dln
Sample ID:	Roll #GTD0134780011		
Sample Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Measurement of the Core Thickness of Textured Geomembranes by ASTM D5994

Testing Machine:	Mitutoyo Digimatic Indicator, Model #: ID-C112EX	Pressure:	2.0 oz
Presser Foot:	cone point	Loading Time:	5 seconds
Specimen Size:	2-inch-diameter		

Measurement Number	Thickness, mils
1	43
2	40
3	40
4	36
5	39
6	41
7	39
8	39
9	42
10	40
Average	40
Standard Deviation	1.8
Coefficient of Variation, %	4.4

Comments:

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	gc
Test Date:	05/14/24	Checked By:	dln
Sample ID:	Roll #GTD0134780016		
Sample Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Measurement of the Core Thickness of Textured Geomembranes by ASTM D5994

Testing Machine:	Mitutoyo Digimatic Indicator, Model #: ID-C112EX	Pressure:	2.0 oz
Presser Foot:	cone point	Loading Time:	5 seconds
Specimen Size:	2-inch-diameter		

Measurement Number	Thickness, mils
1	40
2	41
3	38
4	36
5	44
6	39
7	39
8	41
9	39
10	41
Average	40
Standard Deviation	2.0
Coefficient of Variation, %	5.1

Comments:

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	gc
Test Date:	05/14/24	Checked By:	dln
Sample ID:	Roll #GTD0134780021		
Sample Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Measurement of the Core Thickness of Textured Geomembranes by ASTM D5994

Testing Machine:	Mitutoyo Digimatic Indicator, Model #: ID-C112EX	Pressure:	2.0 oz
Presser Foot:	cone point	Loading Time:	5 seconds
Specimen Size:	2-inch-diameter		

Measurement Number	Thickness, mils
1	41
2	42
3	41
4	40
5	40
6	38
7	39
8	40
9	44
10	39
Average	40
Standard Deviation	1.6
Coefficient of Variation, %	4.0

Comments:

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	gc
Test Date:	05/14/24	Checked By:	dln
Sample ID:	Roll #GTD0134780027		
Sample Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Measurement of the Core Thickness of Textured Geomembranes by ASTM D5994

Testing Machine:	Mitutoyo Digimatic Indicator, Model #: ID-C112EX	Pressure:	2.0 oz
Presser Foot:	cone point	Loading Time:	5 seconds
Specimen Size:	2-inch-diameter		

Measurement Number	Thickness, mils
1	45
2	40
3	41
4	39
5	39
6	42
7	39
8	40
9	40
10	39
Average	40
Standard Deviation	1.9
Coefficient of Variation, %	4.7

Comments:

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	gc
Test Date:	05/14/24	Checked By:	dln
Sample ID:	Roll #GTD0134780032		
Sample Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Measurement of the Core Thickness of Textured Geomembranes by ASTM D5994

Testing Machine:	Mitutoyo Digimatic Indicator, Model #: ID-C112EX	Pressure:	2.0 oz
Presser Foot:	cone point	Loading Time:	5 seconds
Specimen Size:	2-inch-diameter		

Measurement Number	Thickness, mils
1	44
2	39
3	37
4	38
5	40
6	40
7	40
8	39
9	39
10	39
Average	40
Standard Deviation	1.8
Coefficient of Variation, %	4.5

Comments:

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	gc
Test Date:	05/14/24	Checked By:	dln
Sample ID:	Roll #GTD0134780037		
Sample Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Measurement of the Core Thickness of Textured Geomembranes by ASTM D5994

Testing Machine:	Mitutoyo Digimatic Indicator, Model #: ID-C112EX	Pressure:	2.0 oz
Presser Foot:	cone point	Loading Time:	5 seconds
Specimen Size:	2-inch-diameter		

Measurement Number	Thickness, mils
1	41
2	40
3	42
4	40
5	40
6	40
7	38
8	39
9	45
10	41
Average	40
Standard Deviation	1.8
Coefficient of Variation, %	4.4

Comments:

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	gc
Test Date:	05/14/24	Checked By:	dln
Sample ID:	Roll #GTD0134780044		
Sample Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Measurement of the Core Thickness of Textured Geomembranes by ASTM D5994

Testing Machine:	Mitutoyo Digimatic Indicator, Model #: ID-C112EX	Pressure:	2.0 oz
Presser Foot:	cone point	Loading Time:	5 seconds
Specimen Size:	2-inch-diameter		

Measurement Number	Thickness, mils
1	46
2	41
3	40
4	41
5	40
6	41
7	37
8	36
9	44
10	41
Average	41
Standard Deviation	2.7
Coefficient of Variation, %	6.7

Comments:

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	gc
Test Date:	05/14/24	Checked By:	dln
Sample ID:	Roll #GTD0134780047		
Sample Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Measurement of the Core Thickness of Textured Geomembranes by ASTM D5994

Testing Machine:	Mitutoyo Digimatic Indicator, Model #: ID-C112EX	Pressure:	2.0 oz
Presser Foot:	cone point	Loading Time:	5 seconds
Specimen Size:	2-inch-diameter		

Measurement Number	Thickness, mils
1	40
2	42
3	41
4	37
5	39
6	39
7	40
8	40
9	40
10	40
Average	40
Standard Deviation	1.4
Coefficient of Variation, %	3.4

Comments:

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	gc
Test Date:	05/14/24	Checked By:	dln
Sample ID:	Roll #GTD0134780001		
Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes by ASTM D6693

Testing Machine:	Instron 1123	Testing Speed:	2.0 in./min.
Grip Separation, in:	2.5	Grips:	ATS pneumatic
Temperature,°F:	66.2 - 73.4	Die Type:	IV

Direction	Specimen Number	Thickness, mil	YIELD			BREAK		
			Tensile Strength,		Elongation,	Tensile Strength,		Elongation,
			ppi	psi	%	ppi	psi	%
Machine	1	40	---	---	---	162	4004	537
	2	42	---	---	---	170	4043	525
	3	41	---	---	---	133	3264	520
	4	39	---	---	---	142	3604	481
	5	38	---	---	---	131	3463	468
	Average	40	---	---	---	148	3676	506
	Standard Deviation	1.6	---	---	---	17.4	340.1	29.8
Cross Machine	1	40	---	---	---	125	3141	516
	2	40	---	---	---	136	3392	562
	3	41	---	---	---	121	2966	506
	4	38	---	---	---	115	3014	498
	5	38	---	---	---	118	3088	492
	Average	39	---	---	---	123	3120	515
	Standard Deviation	1.1	---	---	---	8.15	166.2	27.9

Comments:
yield gauge length = 1.3 in.
break gauge length = 2.0 in.
ppi = pounds per inch
psi = pounds per square inch

* Yield values not typically reported for LLDPE Materials

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	gc
Test Date:	05/14/24	Checked By:	dln
Sample ID:	Roll #GTD0134780006		
Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes by ASTM D6693

Testing Machine:	Instron 1123	Testing Speed:	2.0 in./min.
Grip Separation, in:	2.5	Grips:	ATS pneumatic
Temperature,°F:	66.2 - 73.4	Die Type:	IV

Direction	Specimen Number	Thickness, mil	YIELD			BREAK		
			Tensile Strength,		Elongation,	Tensile Strength,		Elongation,
			ppi	psi	%	ppi	psi	%
Machine	1	54	---	---	---	171	3157	528
	2	52	---	---	---	171	3302	538
	3	50	---	---	---	133	2672	443
	4	55	---	---	---	191	3509	507
	5	55	---	---	---	212	3866	508
	Average	53	---	---	---	176	3301	505
	Standard Deviation	2.1	---	---	---	29.1	441.1	36.9
Cross Machine	1	55	---	---	---	168	3039	537
	2	53	---	---	---	170	3199	568
	3	50	---	---	---	147	2946	497
	4	57	---	---	---	162	2854	497
	5	62	---	---	---	170	2730	497
	Average	55	---	---	---	163	2954	519
	Standard Deviation	4.6	---	---	---	9.71	178.3	32.0

Comments: yield gauge length = 1.3 in.
break gauge length = 2.0 in.
ppi = pounds per inch
psi = pounds per square inch

* Yield values not typically reported for LLDPE Materials

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	gc
Test Date:	05/14/24	Checked By:	dln
Sample ID:	Roll #GTD0134780011		
Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes by ASTM D6693

Testing Machine:	Instron 1123	Testing Speed:	2.0 in./min.
Grip Separation, in:	2.5	Grips:	ATS pneumatic
Temperature,°F:	66.2 - 73.4	Die Type:	IV

Direction	Specimen Number	Thickness, mil	YIELD			BREAK		
			Tensile Strength,		Elongation,	Tensile Strength,		Elongation,
			ppi	psi	%	ppi	psi	%
Machine	1	43	---	---	---	143	3300	495
	2	40	---	---	---	149	3719	509
	3	40	---	---	---	173	4368	537
	4	36	---	---	---	159	4385	515
	5	41	---	---	---	145	3534	519
	Average	40	---	---	---	154	3861	515
	Standard Deviation	2.6	---	---	---	12.2	493.3	15.3
Cross Machine	1	39	---	---	---	121	3090	512
	2	39	---	---	---	119	3074	508
	3	40	---	---	---	124	3125	524
	4	40	---	---	---	121	3035	515
	5	39	---	---	---	120	3040	502
	Average	39	---	---	---	121	3073	512
	Standard Deviation	0.5	---	---	---	1.80	37.35	8.24

Comments:
yield gauge length = 1.3 in.
break gauge length = 2.0 in.
ppi = pounds per inch
psi = pounds per square inch

* Yield values not typically reported for LLDPE Materials

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	gc
Test Date:	05/14/24	Checked By:	dln
Sample ID:	Roll #GTD0134780016		
Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes by ASTM D6693

Testing Machine:	Instron 1123	Testing Speed:	2.0 in./min.
Grip Separation, in:	2.5	Grips:	ATS pneumatic
Temperature,°F:	66.2 - 73.4	Die Type:	IV

Direction	Specimen Number	Thickness, mil	YIELD			BREAK		
			Tensile Strength,		Elongation,	Tensile Strength,		Elongation,
			ppi	psi	%	ppi	psi	%
Machine	1	40	---	---	---	152	3781	546
	2	39	---	---	---	123	3198	472
	3	38	---	---	---	124	3296	466
	4	36	---	---	---	134	3714	536
	5	44	---	---	---	137	3132	446
	Average	39	---	---	---	134	3424	493
	Standard Deviation	2.9	---	---	---	11.7	301.7	45.0
Cross Machine	1	42	---	---	---	123	2918	515
	2	41	---	---	---	127	3085	536
	3	40	---	---	---	122	3024	541
	4	37	---	---	---	123	3298	543
	5	41	---	---	---	120	2932	499
	Average	40	---	---	---	123	3051	527
	Standard Deviation	1.9	---	---	---	2.52	153.8	19.1

Comments: yield gauge length = 1.3 in.
break gauge length = 2.0 in.
ppi = pounds per inch
psi = pounds per square inch

* Yield values not typically reported for LLDPE Materials

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	gc
Test Date:	05/14/24	Checked By:	dln
Sample ID:	Roll #GTD0134780021		
Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes by ASTM D6693

Testing Machine:	Instron 1123	Testing Speed:	2.0 in./min.
Grip Separation, in:	2.5	Grips:	ATS pneumatic
Temperature,°F:	66.2 - 73.4	Die Type:	IV

Direction	Specimen Number	Thickness, mil	YIELD			BREAK		
			Tensile Strength,		Elongation,	Tensile Strength,		Elongation,
			ppi	psi	%	ppi	psi	%
Machine	1	41	---	---	---	160	3921	520
	2	42	---	---	---	142	3424	501
	3	41	---	---	---	138	3384	490
	4	40	---	---	---	148	3721	519
	5	40	---	---	---	134	3321	474
	Average	41	---	---	---	145	3554	501
	Standard Deviation	0.6	---	---	---	10.1	256.5	19.8
Cross Machine	1	41	---	---	---	133	3261	545
	2	40	---	---	---	127	3162	529
	3	40	---	---	---	122	3067	523
	4	40	---	---	---	117	2938	503
	5	40	---	---	---	117	2936	486
	Average	40	---	---	---	123	3073	517
	Standard Deviation	0.5	---	---	---	6.95	142.0	23.2

Comments:
yield gauge length = 1.3 in.
break gauge length = 2.0 in.
ppi = pounds per inch
psi = pounds per square inch

* Yield values not typically reported for LLDPE Materials

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	gc
Test Date:	05/14/24	Checked By:	dln
Sample ID:	Roll #GTD0134780027		
Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes by ASTM D6693

Testing Machine:	Instron 1123	Testing Speed:	2.0 in./min.
Grip Separation, in:	2.5	Grips:	ATS pneumatic
Temperature,°F:	66.2 - 73.4	Die Type:	IV

Direction	Specimen Number	Thickness, mil	YIELD			BREAK		
			Tensile Strength,		Elongation,	Tensile Strength,		Elongation,
			ppi	psi	%	ppi	psi	%
Machine	1	42	---	---	---	159	3809	488
	2	39	---	---	---	134	3463	509
	3	40	---	---	---	138	3497	528
	4	40	---	---	---	142	3581	525
	5	39	---	---	---	146	3759	540
	Average	40	---	---	---	144	3622	518
	Standard Deviation	1.3	---	---	---	9.66	155.1	20.2
Cross Machine	1	43	---	---	---	140	3267	553
	2	43	---	---	---	126	2928	535
	3	42	---	---	---	133	3195	568
	4	39	---	---	---	126	3255	533
	5	40	---	---	---	127	3209	524
	Average	41	---	---	---	130	3171	543
	Standard Deviation	1.9	---	---	---	6.11	139.0	17.6

Comments: yield gauge length = 1.3 in.
break gauge length = 2.0 in.
ppi = pounds per inch
psi = pounds per square inch

* Yield values not typically reported for LLDPE Materials

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	gc
Test Date:	05/14/24	Checked By:	dln
Sample ID:	Roll #GTD0134780032		
Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes by ASTM D6693

Testing Machine:	Instron 1123	Testing Speed:	2.0 in./min.
Grip Separation, in:	2.5	Grips:	ATS pneumatic
Temperature,°F:	66.2 - 73.4	Die Type:	IV

Direction	Specimen Number	Thickness, mil	YIELD			BREAK		
			Tensile Strength,		Elongation,	Tensile Strength,		Elongation,
			ppi	psi	%	ppi	psi	%
Machine	1	44	---	---	---	159	3608	520
	2	39	---	---	---	160	4062	470
	3	37	---	---	---	171	4668	523
	4	38	---	---	---	143	3736	483
	5	40	---	---	---	161	3992	479
	Average	40	---	---	---	159	4013	495
	Standard Deviation	2.7	---	---	---	9.86	410.2	24.5
Cross Machine	1	39	---	---	---	135	3486	567
	2	41	---	---	---	134	3261	571
	3	41	---	---	---	130	3192	554
	4	39	---	---	---	121	3116	535
	5	40	---	---	---	127	3167	534
	Average	40	---	---	---	129	3244	552
	Standard Deviation	1.0	---	---	---	5.52	144.7	17.2

Comments: yield gauge length = 1.3 in.
break gauge length = 2.0 in.
ppi = pounds per inch
psi = pounds per square inch

* Yield values not typically reported for LLDPE Materials

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	gc
Test Date:	05/14/24	Checked By:	dln
Sample ID:	Roll #GTD0134780037		
Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes by ASTM D6693

Testing Machine:	Instron 1123	Testing Speed:	2.0 in./min.
Grip Separation, in:	2.5	Grips:	ATS pneumatic
Temperature,°F:	66.2 - 73.4	Die Type:	IV

Direction	Specimen Number	Thickness, mil	YIELD			BREAK		
			Tensile Strength,		Elongation,	Tensile Strength,		Elongation,
			ppi	psi	%	ppi	psi	%
Machine	1	41	---	---	---	131	3218	490
	2	40	---	---	---	150	3752	513
	3	42	---	---	---	120	2849	465
	4	40	---	---	---	147	3664	537
	5	40	---	---	---	149	3719	478
	Average	41	---	---	---	139	3440	497
	Standard Deviation	0.8	---	---	---	13.5	395.1	28.7
Cross Machine	1	39	---	---	---	130	3283	482
	2	39	---	---	---	137	3515	507
	3	40	---	---	---	160	3973	499
	4	43	---	---	---	141	3253	577
	5	42	---	---	---	148	3553	519
	Average	41	---	---	---	143	3516	517
	Standard Deviation	1.8	---	---	---	11.6	288.9	36.1

Comments: yield gauge length = 1.3 in.
break gauge length = 2.0 in.
ppi = pounds per inch
psi = pounds per square inch

* Yield values not typically reported for LLDPE Materials

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	gc
Test Date:	05/14/24	Checked By:	dln
Sample ID:	Roll #GTD0134780044		
Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes by ASTM D6693

Testing Machine:	Instron 1123	Testing Speed:	2.0 in./min.
Grip Separation, in:	2.5	Grips:	ATS pneumatic
Temperature,°F:	66.2 - 73.4	Die Type:	IV

Direction	Specimen Number	Thickness, mil	YIELD			BREAK		
			Tensile Strength,		Elongation,	Tensile Strength,		Elongation,
			ppi	psi	%	ppi	psi	%
Machine	1	46	---	---	---	138	2980	463
	2	41	---	---	---	136	3288	520
	3	40	---	---	---	159	3958	491
	4	41	---	---	---	156	3824	493
	5	40	---	---	---	161	4024	503
	Average	42	---	---	---	150	3615	494
	Standard Deviation	2.6	---	---	---	12.2	458.2	20.7
Cross Machine	1	37	---	---	---	129	3492	576
	2	41	---	---	---	128	3105	530
	3	40	---	---	---	126	3131	552
	4	36	---	---	---	133	3681	592
	5	40	---	---	---	125	3131	530
	Average	39	---	---	---	128	3308	556
	Standard Deviation	2.2	---	---	---	3.27	263.1	27.6

Comments: yield gauge length = 1.3 in.
break gauge length = 2.0 in.
ppi = pounds per inch
psi = pounds per square inch

* Yield values not typically reported for LLDPE Materials

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	gc
Test Date:	05/14/24	Checked By:	dln
Sample ID:	Roll #GTD0134780047		
Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes by ASTM D6693

Testing Machine:	Instron 1123	Testing Speed:	2.0 in./min.
Grip Separation, in:	2.5	Grips:	ATS pneumatic
Temperature,°F:	66.2 - 73.4	Die Type:	IV

Direction	Specimen Number	Thickness, mil	YIELD			BREAK		
			Tensile Strength,		Elongation,	Tensile Strength,		Elongation,
			ppi	psi	%	ppi	psi	%
Machine	1	40	---	---	---	158	3904	526
	2	42	---	---	---	154	3619	471
	3	41	---	---	---	170	4150	504
	4	37	---	---	---	141	3810	527
	5	39	---	---	---	161	4148	496
	Average	40	---	---	---	157	3926	505
	Standard Deviation	2.1	---	---	---	10.6	227.9	23.4
Cross Machine	1	43	---	---	---	144	3328	574
	2	38	---	---	---	133	3517	570
	3	40	---	---	---	136	3410	573
	4	39	---	---	---	121	3106	508
	5	41	---	---	---	132	3197	543
	Average	40	---	---	---	133	3311	554
	Standard Deviation	2.1	---	---	---	8.29	163.8	28.8

Comments: yield gauge length = 1.3 in.
break gauge length = 2.0 in.
ppi = pounds per inch
psi = pounds per square inch

* Yield values not typically reported for LLDPE Materials

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	est
Test Date:	05/10/24	Checked By:	dln
Sample ID:	Roll #GTD0134780001		
Sample Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Asperity Height of Textured Geomembranes by ASTM D7466

Testing Machine:	Chicago Dial Indicator, Model #:BG2110
Contact Point:	0.05 in, tapered to point
Test Sample:	3 ft. x roll width

Measurement Number	Asperity Value, inches	
	Side A	Side B
1	0.036	0.037
2	0.035	0.039
3	0.037	0.039
4	0.034	0.037
5	0.037	0.041
6	0.037	0.037
7	0.037	0.037
8	0.037	0.035
9	0.036	0.037
10	0.036	0.034
Average	0.036	0.037
Standard Deviation	0.001	0.002
Coefficient of Variation, %	3.09	4.67

Comments: Side A = Matte
Side B = Shiny

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	est
Test Date:	05/10/24	Checked By:	dln
Sample ID:	Roll #GTD0134780006		
Sample Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Asperity Height of Textured Geomembranes by ASTM D7466

Testing Machine:	Chicago Dial Indicator, Model #:BG2110
Contact Point:	0.05 in, tapered to point
Test Sample:	3 ft. x roll width

Measurement Number	Asperity Value, inches	
	Side A	Side B
1	0.034	0.032
2	0.035	0.036
3	0.036	0.035
4	0.036	0.037
5	0.036	0.036
6	0.037	0.037
7	0.035	0.034
8	0.036	0.036
9	0.036	0.035
10	0.035	0.029
Average	0.035	0.035
Standard Deviation	0.001	0.002
Coefficient of Variation, %	1.84	7.02

Comments: Side A = Matte
Side B = Shiny

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	est
Test Date:	05/10/24	Checked By:	dln
Sample ID:	Roll #GTD0134780011		
Sample Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Asperity Height of Textured Geomembranes by ASTM D7466

Testing Machine:	Chicago Dial Indicator, Model #:BG2110
Contact Point:	0.05 in, tapered to point
Test Sample:	3 ft. x roll width

Measurement Number	Asperity Value, inches	
	Side A	Side B
1	0.038	0.038
2	0.036	0.036
3	0.035	0.037
4	0.037	0.037
5	0.038	0.038
6	0.036	0.037
7	0.034	0.037
8	0.037	0.038
9	0.038	0.037
10	0.036	0.037
Average	0.036	0.037
Standard Deviation	0.001	0.001
Coefficient of Variation, %	3.35	1.47

Comments: Side A = Matte
Side B = Shiny

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	est
Test Date:	05/10/24	Checked By:	dln
Sample ID:	Roll #GTD0134780016		
Sample Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Asperity Height of Textured Geomembranes by ASTM D7466

Testing Machine:	Chicago Dial Indicator, Model #:BG2110
Contact Point:	0.05 in, tapered to point
Test Sample:	3 ft. x roll width

Measurement Number	Asperity Value, inches	
	Side A	Side B
1	0.037	0.037
2	0.037	0.037
3	0.037	0.035
4	0.037	0.034
5	0.037	0.039
6	0.038	0.040
7	0.036	0.035
8	0.039	0.036
9	0.037	0.035
10	0.036	0.036
Average	0.037	0.036
Standard Deviation	0.001	0.002
Coefficient of Variation, %	2.64	4.70

Comments: Side A = Matte
Side B = Shiny

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	est
Test Date:	05/10/24	Checked By:	dln
Sample ID:	Roll #GTD0134780021		
Sample Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Asperity Height of Textured Geomembranes by ASTM D7466

Testing Machine:	Chicago Dial Indicator, Model #:BG2110
Contact Point:	0.05 in, tapered to point
Test Sample:	3 ft. x roll width

Measurement Number	Asperity Value, inches	
	Side A	Side B
1	0.036	0.038
2	0.037	0.037
3	0.037	0.034
4	0.037	0.039
5	0.036	0.039
6	0.035	0.035
7	0.036	0.037
8	0.036	0.036
9	0.037	0.037
10	0.036	0.037
Average	0.036	0.037
Standard Deviation	0.001	0.002
Coefficient of Variation, %	1.90	4.10

Comments: Side A = Matte
Side B = Shiny

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	est
Test Date:	05/10/24	Checked By:	dln
Sample ID:	Roll #GTD0134780027		
Sample Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Asperity Height of Textured Geomembranes by ASTM D7466

Testing Machine:	Chicago Dial Indicator, Model #:BG2110
Contact Point:	0.05 in, tapered to point
Test Sample:	3 ft. x roll width

Measurement Number	Asperity Value, inches	
	Side A	Side B
1	0.035	0.038
2	0.036	0.037
3	0.035	0.038
4	0.040	0.037
5	0.036	0.038
6	0.039	0.035
7	0.036	0.035
8	0.039	0.037
9	0.037	0.034
10	0.036	0.036
Average	0.037	0.036
Standard Deviation	0.002	0.001
Coefficient of Variation, %	4.52	3.43

Comments: Side A = Matte
Side B = Shiny

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	est
Test Date:	05/10/24	Checked By:	dln
Sample ID:	Roll #GTD0134780032		
Sample Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Asperity Height of Textured Geomembranes by ASTM D7466

Testing Machine:	Chicago Dial Indicator, Model #:BG2110
Contact Point:	0.05 in, tapered to point
Test Sample:	3 ft. x roll width

Measurement Number	Asperity Value, inches	
	Side A	Side B
1	0.037	0.038
2	0.038	0.036
3	0.035	0.037
4	0.040	0.036
5	0.038	0.037
6	0.038	0.038
7	0.036	0.035
8	0.037	0.036
9	0.036	0.037
10	0.036	0.038
Average	0.037	0.037
Standard Deviation	0.001	0.001
Coefficient of Variation, %	3.63	2.85

Comments: Side A = Matte
Side B = Shiny

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	est
Test Date:	05/10/24	Checked By:	dln
Sample ID:	Roll #GTD0134780037		
Sample Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Asperity Height of Textured Geomembranes by ASTM D7466

Testing Machine:	Chicago Dial Indicator, Model #:BG2110
Contact Point:	0.05 in, tapered to point
Test Sample:	3 ft. x roll width

Measurement Number	Asperity Value, inches	
	Side A	Side B
1	0.038	0.037
2	0.036	0.039
3	0.036	0.035
4	0.035	0.036
5	0.038	0.037
6	0.037	0.036
7	0.033	0.037
8	0.036	0.038
9	0.035	0.036
10	0.038	0.036
Average	0.036	0.037
Standard Deviation	0.002	0.001
Coefficient of Variation, %	4.25	3.01

Comments: Side A = Matte
Side B = Shiny

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	est
Test Date:	05/10/24	Checked By:	dln
Sample ID:	Roll #GTD0134780044		
Sample Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Asperity Height of Textured Geomembranes by ASTM D7466

Testing Machine:	Chicago Dial Indicator, Model #:BG2110
Contact Point:	0.05 in, tapered to point
Test Sample:	3 ft. x roll width

Measurement Number	Asperity Value, inches	
	Side A	Side B
1	0.036	0.037
2	0.037	0.036
3	0.036	0.038
4	0.034	0.036
5	0.039	0.039
6	0.038	0.032
7	0.034	0.038
8	0.037	0.035
9	0.034	0.035
10	0.035	0.035
Average	0.036	0.036
Standard Deviation	0.002	0.002
Coefficient of Variation, %	4.58	4.84

Comments: Side A = Matte
Side B = Shiny

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	est
Test Date:	05/10/24	Checked By:	dln
Sample ID:	Roll #GTD0134780047		
Sample Description:	Black, 40 mil Agru microspike LLDPE geomembrane		

Asperity Height of Textured Geomembranes by ASTM D7466

Testing Machine:	Chicago Dial Indicator, Model #:BG2110
Contact Point:	0.05 in, tapered to point
Test Sample:	3 ft. x roll width

Measurement Number	Asperity Value, inches	
	Side A	Side B
1	0.037	0.037
2	0.038	0.039
3	0.035	0.038
4	0.036	0.035
5	0.036	0.036
6	0.037	0.036
7	0.036	0.037
8	0.036	0.038
9	0.038	0.036
10	0.035	0.036
Average	0.036	0.037
Standard Deviation	0.001	0.001
Coefficient of Variation, %	2.52	3.20

Comments: Side A = Matte
Side B = Shiny

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/17/24		
Tested By:	est/gc	Report #:	1
Checked By:	dln	Page:	1 of 18

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-1	Machine ID:	86
Seam ID:	6/7	Welder ID:	OD
		Date Sampled:	06/12/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	82	---	SE1	107	---	SE1	129	150	Lower
2	87	---	SE1	108	---	SE1	125	210	Upper
3	86	---	SE1	107	---	SE1	128	140	Lower
4	82	---	SE1	108	---	SE1	127	130	Lower
5	82	---	SE1	105	---	SE1	132	200	Upper
Average	84	---	---	107	---	---	128	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/17/24		
Tested By:	est/gc	Report #:	1
Checked By:	dln	Page:	2 of 18

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-2	Machine ID:	717
Seam ID:	7/9	Welder ID:	CO
		Date Sampled:	06/12/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	99	---	SE1	98	---	SE1	128	110	Lower
2	92	---	SE1	92	---	SE1	127	180	Lower
3	97	---	SE1	97	---	SE1	130	130	Lower
4	93	---	SE1	88	---	SE1	128	130	Lower
5	101	---	SE1	92	---	SE1	131	110	Lower
Average	97	---	---	93	---	---	129	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/17/24		
Tested By:	est/gc	Report #:	1
Checked By:	dln	Page:	3 of 18

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-3	Machine ID:	717
Seam ID:	10/11	Welder ID:	CO
		Date Sampled:	06/12/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	95	---	SE1	98	---	SE1	127	160	Lower
2	92	---	SE1	100	---	SE1	126	140	Lower
3	90	---	SE1	96	---	SE1	128	150	Lower
4	98	---	SE1	101	---	SE1	128	130	Lower
5	92	---	SE1	106	---	SE1	131	160	Upper
Average	94	---	---	101	---	---	128	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/17/24		
Tested By:	est/gc	Report #:	1
Checked By:	dln	Page:	4 of 18

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-4	Machine ID:	86
Seam ID:	11/13	Welder ID:	OD
		Date Sampled:	06/12/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	95	---	SE1	97	---	SE1	122	160	Lower
2	93	---	SE1	96	---	SE1	122	160	Lower
3	98	---	SE1	103	---	SE1	122	180	Lower
4	94	---	SE1	103	---	SE1	120	150	Lower
5	87	---	SE1	103	---	SE1	125	140	Lower
Average	94	---	---	101	---	---	122	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/17/24		
Tested By:	est/gc	Report #:	1
Checked By:	dln	Page:	5 of 18

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-5	Machine ID:	717
Seam ID:	15/17	Welder ID:	CO
		Date Sampled:	06/12/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	106	---	SE1	105	---	SE1	124	160	Lower
2	95	---	SE1	101	---	SE1	123	210	Lower
3	97	---	SE1	104	---	SE1	125	300	Both
4	97	---	SE1	105	---	SE1	123	150	Lower
5	83	---	SE1	106	---	SE1	124	130	Lower
Average	95	---	---	104	---	---	124	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/17/24		
Tested By:	est/gc	Report #:	1
Checked By:	dln	Page:	6 of 18

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-6	Machine ID:	86
Seam ID:	17/18	Welder ID:	OD
		Date Sampled:	06/12/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	105	---	SE1	105	---	SE1	122	150	Upper
2	96	---	SE1	101	---	SE1	121	170	Upper
3	98	---	SE1	104	---	SE1	122	170	Upper
4	95	---	SE1	106	---	SE1	122	150	Upper
5	89	---	SE1	106	---	SE1	125	130	Lower
Average	97	---	---	104	---	---	122	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/17/24		
Tested By:	est/gc	Report #:	1
Checked By:	dln	Page:	7 of 18

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-7	Machine ID:	86
Seam ID:	18/20	Welder ID:	OD
		Date Sampled:	06/12/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	91	---	SE1	107	---	SE1	132	150	Upper
2	82	---	SE1	104	---	SE1	128	170	Lower
3	89	---	SE1	103	---	SE1	128	120	Lower
4	94	---	SE1	86	---	SE1	129	100	Lower
5	89	---	SE1	91	---	SE1	130	120	Lower
Average	89	---	---	98	---	---	129	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/17/24		
Tested By:	est/gc	Report #:	1
Checked By:	dln	Page:	8 of 18

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-8	Machine ID:	717
Seam ID:	19/21	Welder ID:	CO
		Date Sampled:	06/12/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	78	---	SE1	99	---	SE1	128	150	Lower
2	78	---	SE1	100	---	SE1	126	180	Lower
3	75	---	SE1	94	---	SE1	127	100	Lower
4	106	---	SE1	97	---	SE1	129	160	Upper
5	105	---	SE1	100	---	SE1	128	180	Lower
Average	89	---	---	98	---	---	128	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/17/24		
Tested By:	est/gc	Report #:	1
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Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-9	Machine ID:	86
Seam ID:	21/22	Welder ID:	OD
		Date Sampled:	06/12/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	101	---	SE1	102	---	SE1	127	130	Lower
2	95	---	SE1	101	---	SE1	123	180	Lower
3	96	---	SE1	100	---	SE1	126	170	Lower
4	88	---	SE1	102	---	SE1	123	170	Lower
5	88	---	SE1	98	---	SE1	125	110	Lower
Average	93	---	---	100	---	---	125	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/17/24		
Tested By:	est/gc	Report #:	1
Checked By:	dln	Page:	10 of 18

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-10	Machine ID:	717
Seam ID:	30/32	Welder ID:	CO
		Date Sampled:	06/13/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	93	---	SE1	90	---	SE1	124	140	Lower
2	87	---	SE1	95	---	SE1	125	180	Lower
3	85	---	SE1	91	---	SE1	128	150	Lower
4	85	---	SE1	89	---	SE1	122	170	Lower
5	90	---	SE1	93	---	SE1	126	140	Uppper
Average	88	---	---	92	---	---	125	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/17/24		
Tested By:	est/gc	Report #:	1
Checked By:	dln	Page:	11 of 18

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-11	Machine ID:	86
Seam ID:	32/33	Welder ID:	OD
		Date Sampled:	06/13/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	100	---	SE1	98	---	SE1	123	150	Lower
2	98	---	SE1	100	---	SE1	120	160	Lower
3	93	---	SE1	96	---	SE1	124	200	Lower
4	94	---	SE1	94	---	SE1	122	130	Upper
5	99	---	SE1	100	---	SE1	125	150	Lower
Average	97	---	---	97	---	---	123	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/17/24		
Tested By:	est/gc	Report #:	1
Checked By:	dln	Page:	12 of 18

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-12	Machine ID:	---
Seam ID:	36/38	Welder ID:	---
		Date Sampled:	06/13/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	81	---	SE1	86	---	SE1	126	140	Upper
2	79	---	SE1	83	---	SE1	125	130	Upper
3	81	---	SE1	92	---	SE1	127	110	Upper
4	81	---	SE1	99	---	SE1	125	210	Lower
5	80	---	SE1	99	---	SE1	128	160	Lower
Average	81	---	---	92	---	---	126	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/17/24		
Tested By:	est/gc	Report #:	1
Checked By:	dln	Page:	13 of 18

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-13	Machine ID:	86
Seam ID:	38/39	Welder ID:	OD
		Date Sampled:	06/13/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	99	---	SE1	109	---	SE1	127	160	Upper
2	93	---	SE1	107	---	SE1	125	230	Lower
3	99	---	SE1	108	---	SE1	123	160	Lower
4	99	---	SE1	108	---	SE1	121	220	Lower
5	102	---	SE1	107	---	SE1	124	200	Lower
Average	98	---	---	108	---	---	124	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/17/24		
Tested By:	est/gc	Report #:	1
Checked By:	dln	Page:	14 of 18

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-14	Machine ID:	717
Seam ID:	40/43	Welder ID:	CO
		Date Sampled:	06/13/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	89	---	SE1	103	---	SE1	128	180	Lower
2	93	---	SE1	102	---	SE1	127	170	Lower
3	85	---	SE1	100	---	SE1	127	190	Lower
4	106	---	SE1	100	---	SE1	125	130	Lower
5	79	---	SE1	99	---	SE1	126	200	Lower
Average	90	---	---	101	---	---	127	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/17/24		
Tested By:	est/gc	Report #:	1
Checked By:	dln	Page:	15 of 18

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-15	Machine ID:	86
Seam ID:	43/44	Welder ID:	OD
		Date Sampled:	06/13/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	98	---	SE1	105	---	SE1	122	190	Lower
2	101	---	SE1	102	---	SE1	123	210	Lower
3	85	---	SE1	101	---	SE1	124	150	Lower
4	85	---	SE1	103	---	SE1	123	140	Lower
5	85	---	SE1	107	---	SE1	123	170	Lower
Average	91	---	---	104	---	---	123	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/17/24		
Tested By:	est/gc	Report #:	1
Checked By:	dln	Page:	16 of 18

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-16	Machine ID:	717
Seam ID:	49/50	Welder ID:	CO
		Date Sampled:	06/13/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	88	---	SE1	91	---	SE1	129	190	Lower
2	85	---	SE1	92	---	SE1	127	180	Lower
3	85	---	SE1	89	---	SE1	128	180	Lower
4	79	---	SE1	93	---	SE1	124	200	Lower
5	87	---	SE1	97	---	SE1	127	180	Lower
Average	85	---	---	93	---	---	127	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/17/24		
Tested By:	est/gc	Report #:	1
Checked By:	dln	Page:	17 of 18

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-17	Machine ID:	86
Seam ID:	51/53	Welder ID:	OD
		Date Sampled:	06/13/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	104	---	SE1	108	---	SE1	122	180	Lower
2	108	---	SE1	106	---	SE1	123	190	Lower
3	82	---	SE1	107	---	SE1	125	180	Lower
4	89	---	SE1	107	---	SE1	123	210	Lower
5	93	---	SE1	110	---	SE1	126	160	Lower
Average	95	---	---	108	---	---	124	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/17/24		
Tested By:	est/gc	Report #:	1
Checked By:	dln	Page:	18 of 18

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-18	Machine ID:	717
Seam ID:	52/53	Welder ID:	CO
		Date Sampled:	06/13/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	94	---	SE1	95	---	SE1	99	150	Upper
2	90	---	SE1	95	---	SE1	98	180	Upper
3	95	---	SE1	97	---	SE1	102	140	Upper
4	93	---	SE1	96	---	SE1	103	150	Upper
5	93	---	SE1	94	---	SE1	102	180	Upper
Average	93	---	---	96	---	---	101	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/17/24		
Tested By:	est/gc	Report #:	2
Checked By:	dln	Page:	4 of 6

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-22	Machine ID:	717
Seam ID:	64/65	Welder ID:	CO
		Date Sampled:	---

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	81	---	SE1	92	---	SE1	126	140	Upper
2	83	---	SE1	92	---	SE1	125	150	Upper
3	84	---	SE1	95	---	SE1	124	160	Upper
4	84	---	SE1	88	---	SE1	126	160	Upper
5	80	---	SE1	93	---	SE1	129	170	Upper
Average	82	---	---	92	---	---	126	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/17/24		
Tested By:	est/gc	Report #:	2
Checked By:	dln	Page:	1 of 6

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-19	Machine ID:	86
Seam ID:	56/57	Welder ID:	OD
		Date Sampled:	06/14/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	82	---	SE1	92	---	SE1	124	140	Upper
2	82	---	SE1	83	---	SE1	123	140	Upper
3	85	---	SE1	96	---	SE1	123	180	Lower
4	89	---	SE1	91	---	SE1	123	140	Upper
5	87	---	SE1	76	---	SE1	125	200	Lower
Average	85	---	---	88	---	---	123	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/17/24		
Tested By:	est/gc	Report #:	2
Checked By:	dln	Page:	2 of 6

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-20	Machine ID:	717
Seam ID:	59/60	Welder ID:	CO
		Date Sampled:	06/14/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	89	---	SE1	96	---	SE1	123	130	Upper
2	90	---	SE1	97	---	SE1	119	180	Upper
3	103	---	SE1	96	---	SE1	121	150	Upper
4	100	---	SE1	95	---	SE1	122	140	Lower
5	96	---	SE1	91	---	SE1	126	100	Lower
Average	96	---	---	95	---	---	122	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/17/24		
Tested By:	est/gc	Report #:	2
Checked By:	dln	Page:	3 of 6

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-21	Machine ID:	86
Seam ID:	63/64	Welder ID:	OD
		Date Sampled:	06/14/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	101	---	SE1	96	---	SE1	125	130	Upper
2	103	---	SE1	93	---	SE1	123	190	Upper
3	106	---	SE1	99	---	SE1	122	120	Lower
4	101	---	SE1	93	---	SE1	125	140	Upper
5	96	---	SE1	103	---	SE1	128	160	Upper
Average	101	---	---	97	---	---	125	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/17/24		
Tested By:	est/gc	Report #:	2
Checked By:	dln	Page:	5 of 6

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-23	Machine ID:	86
Seam ID:	65/67	Welder ID:	OD
		Date Sampled:	06/14/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	97	---	SE1	102	---	SE1	121	140	Upper
2	85	---	SE1	97	---	SE1	120	140	Upper
3	91	---	SE1	104	---	SE1	119	120	Lower
4	89	---	SE1	101	---	SE1	119	130	Lower
5	92	---	SE1	101	---	SE1	121	100	Lower
Average	91	---	---	101	---	---	120	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/17/24		
Tested By:	est/gc	Report #:	2
Checked By:	dln	Page:	6 of 6

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-24	Machine ID:	717
Seam ID:	68/69	Welder ID:	CO
		Date Sampled:	06/14/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	103	---	SE1	98	---	SE1	120	130	Lower
2	97	---	SE1	95	---	SE1	117	180	Lower
3	101	---	SE1	99	---	SE1	121	180	Lower
4	97	---	SE1	99	---	SE1	119	190	Lower
5	94	---	SE1	100	---	SE1	123	170	Upper
Average	98	---	---	98	---	---	120	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/24/24		
Tested By:	est/chf	Report #:	3
Checked By:	dln	Page:	1 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-25	Machine ID:	86
Seam ID:	74/76	Welder ID:	OD
		Date Sampled:	06/21/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	100	---	SE1	102	---	SE1	111	170	Lower
2	90	---	SE1	98	---	SE1	113	300	Both
3	102	---	SE1	92	---	SE1	113	370	Both
4	100	---	SE1	101	---	SE1	113	110	Upper
5	101	---	SE1	97	---	SE1	116	160	Upper
Average	98	---	---	98	---	---	113	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/24/24		
Tested By:	est/chf	Report #:	3
Checked By:	dln	Page:	2 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-26	Machine ID:	717
Seam ID:	76/77	Welder ID:	CO
		Date Sampled:	06/21/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	90	---	SE1	100	---	SE1	126	120	Upper
2	89	---	SE1	90	---	SE1	125	130	Upper
3	94	---	SE1	94	---	SE1	128	120	Upper
4	92	---	SE1	90	---	SE1	126	120	Upper
5	98	---	SE1	92	---	SE1	130	110	Upper
Average	93	---	---	93	---	---	127	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/24/24		
Tested By:	est/chf	Report #:	3
Checked By:	dln	Page:	3 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-27	Machine ID:	86
Seam ID:	79/81	Welder ID:	OD
		Date Sampled:	06/21/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	103	---	SE1	109	---	SE1	122	140	Upper
2	98	---	SE1	106	---	SE1	122	110	Upper
3	107	---	SE1	110	---	SE1	122	90	Upper
4	106	---	SE1	107	---	SE1	120	120	Upper
5	102	---	SE1	106	---	SE1	125	110	Upper
Average	103	---	---	108	---	---	122	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/24/24		
Tested By:	est/chf	Report #:	3
Checked By:	dln	Page:	4 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-28	Machine ID:	717
Seam ID:	81/82	Welder ID:	CO
		Date Sampled:	06/21/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	90	---	SE1	109	---	SE1	126	180	Lower
2	84	---	SE1	108	---	SE1	125	170	Upper
3	94	---	SE1	109	---	SE1	127	290	Both
4	87	---	SE1	108	---	SE1	123	180	Upper
5	86	---	SE1	108	---	SE1	129	110	Upper
Average	88	---	---	108	---	---	126	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/24/24		
Tested By:	est/chf	Report #:	3
Checked By:	dln	Page:	5 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-29	Machine ID:	717
Seam ID:	88/89	Welder ID:	CO
		Date Sampled:	06/21/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	87	---	SE1	93	---	SE1	128	130	Upper
2	90	---	SE1	89	---	SE1	126	140	Lower
3	87	---	SE1	92	---	SE1	125	180	Lower
4	88	---	SE1	88	---	SE1	120	140	Lower
5	88	---	SE1	87	---	SE1	126	120	Lower
Average	88	---	---	90	---	---	125	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/24/24		
Tested By:	est/chf	Report #:	3
Checked By:	dln	Page:	6 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-30	Machine ID:	86
Seam ID:	89/91	Welder ID:	OD
		Date Sampled:	06/21/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	89	---	SE1	91	---	SE1	123	130	Lower
2	92	---	SE1	86	---	SE1	124	160	Upper
3	105	---	SE1	84	---	SE1	126	190	Lower
4	93	---	SE1	92	---	SE1	123	190	Lower
5	78	---	SE1	80	---	SE1	124	190	Lower
Average	92	---	---	87	---	---	124	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/24/24		
Tested By:	est/chf	Report #:	3
Checked By:	dln	Page:	7 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-31	Machine ID:	717
Seam ID:	91/92	Welder ID:	CO
		Date Sampled:	06/21/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	85	---	SE1	76	---	SE1	118	210	Lower
2	84	---	SE1	81	---	SE1	122	260	Lower
3	85	---	SE1	79	---	SE1	125	190	Lower
4	85	---	SE1	82	---	SE1	122	180	Lower
5	83	---	SE1	83	---	SE1	122	170	Lower
Average	84	---	---	80	---	---	122	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/24/24		
Tested By:	est/chf	Report #:	3
Checked By:	dln	Page:	8 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-32	Machine ID:	86
Seam ID:	92/93	Welder ID:	OD
		Date Sampled:	06/21/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	102	---	SE1	104	---	SE1	121	160	Lower
2	104	---	SE1	89	---	SE1	120	360	Both
3	109	---	SE1	89	---	SE1	120	230	Lower
4	104	---	SE1	102	---	SE1	119	170	Lower
5	99	---	SE1	105	---	SE1	123	210	Lower
Average	104	---	---	98	---	---	121	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/24/24		
Tested By:	est/chf	Report #:	3
Checked By:	dln	Page:	9 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-33	Machine ID:	717
Seam ID:	102/103	Welder ID:	CO
		Date Sampled:	06/21/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	91	---	SE1	108	---	SE1	120	130	Lower
2	94	---	SE1	94	---	SE1	121	150	Lower
3	97	---	SE1	88	---	SE1	121	140	Lower
4	96	---	SE1	92	---	SE1	119	190	Upper
5	96	---	SE1	96	---	SE1	124	150	Lower
Average	95	---	---	95	---	---	121	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/24/24		
Tested By:	est/chf	Report #:	3
Checked By:	dln	Page:	10 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-34	Machine ID:	86
Seam ID:	103/104	Welder ID:	OD
		Date Sampled:	06/21/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	86	---	SE1	85	---	SE1	129	100	Upper
2	83	---	SE1	90	---	SE1	126	100	Upper
3	80	---	SE1	91	---	SE1	131	180	Lower
4	76	---	SE1	75	---	SE1	126	90	Upper
5	87	---	SE1	75	---	SE1	129	120	Lower
Average	82	---	---	83	---	---	128	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/24/24		
Tested By:	est/chf	Report #:	3
Checked By:	dln	Page:	11 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-35	Machine ID:	717
Seam ID:	105/107	Welder ID:	CO
		Date Sampled:	06/21/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	90	---	SE1	91	---	SE1	122	160	Lower
2	91	---	SE1	91	---	SE1	127	190	Upper
3	91	---	SE1	87	---	SE1	125	240	Lower
4	95	---	SE1	80	---	SE1	125	130	Upper
5	93	---	SE1	73	---	SE1	127	150	Upper
Average	92	---	---	84	---	---	125	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/27/24		
Tested By:	est	Report #:	4
Checked By:	dln	Page:	1 of 7

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-36	Machine ID:	86
Seam ID:	107/108	Welder ID:	OD
		Date Sampled:	06/21/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	86	---	SE1	96	---	SE1	129	170	Lower
2	87	---	SE1	92	---	SE1	125	210	Lower
3	89	---	SE1	94	---	SE1	125	210	Lower
4	88	---	SE1	90	---	SE1	125	170	Lower
5	91	---	SE1	87	---	SE1	127	180	Lower
Average	88	---	---	92	---	---	126	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/27/24		
Tested By:	est	Report #:	4
Checked By:	dln	Page:	2 of 7

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-37	Machine ID:	86
Seam ID:	113/114	Welder ID:	OD
		Date Sampled:	06/26/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	89	---	SE1	89	---	SE1	122	110	Lower
2	90	---	SE1	88	---	SE1	123	160	Lower
3	89	---	SE1	90	---	SE1	123	190	Lower
4	96	---	SE1	97	---	SE1	120	150	Upper
5	93	---	SE1	93	---	SE1	120	110	Lower
Average	92	---	---	91	---	---	122	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%. Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/27/24		
Tested By:	est	Report #:	4
Checked By:	dln	Page:	3 of 7

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-38	Machine ID:	717
Seam ID:	114/116	Welder ID:	CO
		Date Sampled:	06/26/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	63	---	SE1	101	---	SE1	123	110	Lower
2	80	---	SE1	103	---	SE1	121	220	Lower
3	83	---	SE1	106	---	SE1	122	140	Lower
4	85	---	SE1	102	---	SE1	119	150	Lower
5	86	---	SE1	106	---	SE1	121	180	Lower
Average	79	---	---	103	---	---	121	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/27/24		
Tested By:	est	Report #:	4
Checked By:	dln	Page:	4 of 7

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-39	Machine ID:	86
Seam ID:	123/124	Welder ID:	OD
		Date Sampled:	06/26/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	90	---	SE1	97	---	SE1	110	190	Upper
2	87	---	SE1	95	---	SE1	110	240	Upper
3	103	---	SE1	101	---	SE1	116	180	Upper
4	85	---	SE1	95	---	SE1	112	170	Upper
5	91	---	SE1	95	---	SE1	115	160	Upper
Average	91	---	---	97	---	---	113	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS
A SERCEL COMPANY

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/27/24		
Tested By:	est	Report #:	4
Checked By:	dln	Page:	5 of 7

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-40	Machine ID:	717
Seam ID:	122/125	Welder ID:	CO
		Date Sampled:	06/26/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	90	---	SE1	91	---	SE1	100	110	Lower
2	89	---	SE1	89	---	SE1	97	120	Lower
3	94	---	SE1	96	---	SE1	96	150	Lower
4	95	---	SE1	96	---	SE1	110	270	Both
5	97	---	SE1	98	---	SE1	103	140	Lower
Average	93	---	---	94	---	---	101	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/27/24		
Tested By:	est	Report #:	4
Checked By:	dln	Page:	6 of 7

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-41	Machine ID:	717
Seam ID:	127/129	Welder ID:	CO
		Date Sampled:	06/26/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	95	---	SE1	96	---	SE1	115	100	Lower
2	89	---	SE1	91	---	SE1	117	140	Lower
3	95	---	SE1	92	---	SE1	118	150	Lower
4	92	---	SE1	91	---	SE1	114	170	Lower
5	96	---	SE1	94	---	SE1	115	130	Lower
Average	94	---	---	93	---	---	116	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	06/27/24		
Tested By:	est	Report #:	4
Checked By:	dln	Page:	7 of 7

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-42	Machine ID:	86
Seam ID:	131/132	Welder ID:	OD
		Date Sampled:	06/21/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	93	---	SE1	92	---	SE1	121	170	Lower
2	94	---	SE1	91	---	SE1	118	150	Lower
3	95	---	SE1	92	---	SE1	119	160	Lower
4	93	---	SE1	95	---	SE1	118	140	Lower
5	92	---	SE1	94	---	SE1	119	150	Lower
Average	93	---	---	93	---	---	119	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/01/24		
Tested By:	est	Report #:	5
Checked By:	dln	Page:	1 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-43	Machine ID:	717
Seam ID:	132/133	Welder ID:	CO
		Date Sampled:	06/28/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	100	---	SE1	98	---	SE1	120	160	Lower
2	93	---	SE1	99	---	SE1	121	130	Lower
3	93	---	SE1	92	---	SE1	122	90	Lower
4	89	---	SE1	101	---	SE1	122	80	Lower
5	95	---	SE1	96	---	SE1	119	140	Lower
Average	94	---	---	97	---	---	121	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/01/24		
Tested By:	est	Report #:	5
Checked By:	dln	Page:	2 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-44	Machine ID:	717
Seam ID:	136/137	Welder ID:	CO
		Date Sampled:	06/28/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	100	---	SE1	93	---	SE1	117	180	Upper
2	97	---	SE1	95	---	SE1	119	190	Upper
3	89	---	SE1	99	---	SE1	120	140	Lower
4	83	---	SE1	94	---	SE1	118	100	Lower
5	86	---	SE1	99	---	SE1	121	160	Upper
Average	91	---	---	96	---	---	119	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%. Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS
A SERCEL COMPANY

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/01/24		
Tested By:	est	Report #:	5
Checked By:	dln	Page:	3 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-45	Machine ID:	86
Seam ID:	137/138	Welder ID:	OD
		Date Sampled:	06/28/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	86	---	SE1	93	---	SE1	119	160	Lower
2	79	---	SE1	97	---	SE1	118	350	Both
3	90	---	SE1	101	---	SE1	120	170	Lower
4	95	---	SE1	94	---	SE1	115	220	Lower
5	92	---	SE1	98	---	SE1	118	220	Lower
Average	88	---	---	97	---	---	118	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS
A SERCEL COMPANY

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/01/24		
Tested By:	est	Report #:	5
Checked By:	dln	Page:	4 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-46	Machine ID:	717
Seam ID:	141/143	Welder ID:	CO
		Date Sampled:	06/28/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	103	---	SE1	95	---	SE1	117	130	Upper
2	100	---	SE1	91	---	SE1	119	130	Upper
3	95	---	SE1	93	---	SE1	118	120	Upper
4	87	---	SE1	91	---	SE1	116	140	Upper
5	90	---	SE1	95	---	SE1	121	110	Upper
Average	95	---	---	93	---	---	118	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%. Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS
A SERCEL COMPANY

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/01/24		
Tested By:	est	Report #:	5
Checked By:	dln	Page:	5 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-47	Machine ID:	86
Seam ID:	142/144	Welder ID:	OD
		Date Sampled:	06/28/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	97	---	SE1	93	---	SE1	124	130	Upper
2	87	---	SE1	91	---	SE1	121	160	Lower
3	91	---	SE1	91	---	SE1	121	140	Lower
4	90	---	SE1	102	---	SE1	121	160	Lower
5	90	---	SE1	92	---	SE1	123	140	Lower
Average	91	---	---	94	---	---	122	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%. Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/01/24		
Tested By:	est	Report #:	5
Checked By:	dln	Page:	6 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-48	Machine ID:	86
Seam ID:	145/147	Welder ID:	OD
		Date Sampled:	06/28/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	90	---	SE1	91	---	SE1	119	140	Upper
2	92	---	SE1	89	---	SE1	117	210	Upper
3	100	---	SE1	91	---	SE1	121	460	Both
4	94	---	SE1	87	---	SE1	119	180	Lower
5	101	---	SE1	90	---	SE1	123	130	Lower
Average	96	---	---	90	---	---	120	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%. Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS
A SERCEL COMPANY

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/01/24		
Tested By:	est	Report #:	5
Checked By:	dln	Page:	7 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-49	Machine ID:	717
Seam ID:	146/147	Welder ID:	CO
		Date Sampled:	06/28/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	88	---	SE1	90	---	SE1	94	270	Both
2	87	---	SE1	86	---	SE1	90	110	Lower
3	86	---	SE1	87	---	SE1	93	100	Lower
4	85	---	SE1	87	---	SE1	92	140	Upper
5	88	---	SE1	88	---	SE1	91	340	Both
Average	87	---	---	88	---	---	92	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/01/24		
Tested By:	est	Report #:	5
Checked By:	dln	Page:	8 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-50	Machine ID:	717
Seam ID:	149/151	Welder ID:	CO
		Date Sampled:	06/28/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	99	---	SE1	96	---	SE1	114	180	Lower
2	84	---	SE1	92	---	SE1	111	240	Lower
3	95	---	SE1	97	---	SE1	114	240	Lower
4	88	---	SE1	95	---	SE1	111	210	Lower
5	88	---	SE1	93	---	SE1	113	220	Lower
Average	91	---	---	95	---	---	113	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS
A SERCEL COMPANY

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/01/24		
Tested By:	est	Report #:	5
Checked By:	dln	Page:	9 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-51	Machine ID:	86
Seam ID:	153/155	Welder ID:	OD
		Date Sampled:	06/28/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	95	---	SE1	83	---	SE1	117	150	Lower
2	97	---	SE1	91	---	SE1	117	180	Lower
3	85	---	SE1	88	---	SE1	117	190	Lower
4	94	---	SE1	80	---	SE1	115	150	Lower
5	88	---	SE1	81	---	SE1	116	210	Lower
Average	92	---	---	85	---	---	116	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/01/24		
Tested By:	est	Report #:	5
Checked By:	dln	Page:	10 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-52	Machine ID:	717
Seam ID:	157/158	Welder ID:	CO
		Date Sampled:	06/28/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	83	---	SE1	81	---	SE1	126	100	Lower
2	83	---	SE1	78	---	SE1	125	140	Lower
3	83	---	SE1	86	---	SE1	128	140	Lower
4	98	---	SE1	91	---	SE1	126	180	Lower
5	100	---	SE1	93	---	SE1	126	130	Lower
Average	89	---	---	86	---	---	126	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%. Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS
A SERCEL COMPANY

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/01/24		
Tested By:	est	Report #:	5
Checked By:	dln	Page:	11 of 11

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-53	Machine ID:	86
Seam ID:	159/160	Welder ID:	OD
		Date Sampled:	06/28/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	85	---	SE1	99	---	SE1	119	130	Upper
2	92	---	SE1	100	---	SE1	120	160	Upper
3	93	---	SE1	94	---	SE1	123	120	Upper
4	88	---	SE1	94	---	SE1	121	160	Upper
5	82	---	SE1	96	---	SE1	121	190	Lower
Average	88	---	---	97	---	---	121	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%. Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/22/24		
Tested By:	est	Report #:	6
Checked By:	dln	Page:	1 of 4

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE	Testing Speed:	20 in/min
Seaming Method:	Fillet Extrusion Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-54	Machine ID:	616
Seam ID:	59/163	Welder ID:	CO
		Date Sampled:	07/19/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	100	---	SE3	---	---	---	99	300	Both
2	91	---	SE3	---	---	---	99	340	Both
3	92	---	SE3	---	---	---	98	210	Lower
4	108	---	SE3	---	---	---	99	320	Both
5	94	---	SE3	---	---	---	92	220	Lower
Average	97	---	---	---	---	---	97	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%. Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS
A SERCEL COMPANY

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/22/24		
Tested By:	est	Report #:	6
Checked By:	dln	Page:	2 of 4

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-55	Machine ID:	717
Seam ID:	164/165	Welder ID:	CO
		Date Sampled:	07/19/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	87	---	SE1	100	---	SE1	115	160	Lower
2	98	---	SE1	101	---	SE1	116	180	Lower
3	95	---	SE1	99	---	SE1	114	190	Lower
4	101	---	SE1	98	---	SE1	118	140	Lower
5	105	---	SE1	100	---	SE1	111	110	Lower
Average	97	---	---	99	---	---	115	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%. Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS
A SERCEL COMPANY

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/22/24		
Tested By:	est	Report #:	6
Checked By:	dln	Page:	3 of 4

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-56	Machine ID:	86
Seam ID:	163/166	Welder ID:	OD
		Date Sampled:	07/19/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	96	---	SE1	98	---	SE1	121	120	Lower
2	89	---	SE1	97	---	SE1	125	100	Lower
3	107	---	SE1	103	---	SE1	124	120	Lower
4	91	---	SE1	105	---	SE1	124	90	Lower
5	94	---	SE1	105	---	SE1	124	130	Lower
Average	95	---	---	102	---	---	124	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%. Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS
A SERCEL COMPANY

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/22/24		
Tested By:	est	Report #:	6
Checked By:	dln	Page:	4 of 4

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-57	Machine ID:	717
Seam ID:	166/167	Welder ID:	CO
		Date Sampled:	07/19/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	102	---	SE1	96	---	SE1	120	160	Upper
2	99	---	SE1	85	---	SE1	122	140	Upper
3	103	---	SE1	83	---	SE1	120	170	Upper
4	97	---	SE1	95	---	SE1	119	180	Upper
5	96	---	SE1	91	---	SE1	122	150	Upper
Average	99	---	---	90	---	---	121	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS
A SERCEL COMPANY

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/23/24		
Tested By:	est	Report #:	7
Checked By:	dln	Page:	1 of 9

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-58	Machine ID:	717
Seam ID:	167/168	Welder ID:	CO
		Date Sampled:	07/22/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	100	---	SE1	105	---	SE1	121	180	Upper
2	96	---	SE1	104	---	SE1	118	220	Upper
3	94	---	SE1	104	---	SE1	121	120	Upper
4	98	---	SE1	98	---	SE1	115	140	Upper
5	98	---	SE1	100	---	SE1	119	130	Upper
Average	97	---	---	102	---	---	119	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%. Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/23/24		
Tested By:	est	Report #:	7
Checked By:	dln	Page:	2 of 9

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-59	Machine ID:	86
Seam ID:	168/169	Welder ID:	OD
		Date Sampled:	07/22/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	98	---	SE1	103	---	SE1	120	210	Upper
2	99	---	SE1	102	---	SE1	118	220	Upper
3	106	---	SE1	95	---	SE1	120	340	Both
4	104	---	SE1	95	---	SE1	119	220	Upper
5	102	---	SE1	91	---	SE1	123	140	Lower
Average	102	---	---	97	---	---	120	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS
A SERCEL COMPANY

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/23/24		
Tested By:	est	Report #:	7
Checked By:	dln	Page:	3 of 9

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-60	Machine ID:	717
Seam ID:	169/170	Welder ID:	CO
		Date Sampled:	07/22/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	105	---	SE1	102	---	SE1	121	130	Lower
2	103	---	SE1	99	---	SE1	121	160	Lower
3	102	---	SE1	106	---	SE1	119	160	Upper
4	101	---	SE1	97	---	SE1	119	290	Both
5	104	---	SE1	103	---	SE1	120	150	Upper
Average	103	---	---	101	---	---	120	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/23/24		
Tested By:	est	Report #:	7
Checked By:	dln	Page:	4 of 9

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-61	Machine ID:	86
Seam ID:	170/171	Welder ID:	OD
		Date Sampled:	07/22/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	94	---	SE1	107	---	SE1	121	160	Upper
2	92	---	SE1	106	---	SE1	116	210	Upper
3	93	---	SE1	108	---	SE1	119	320	Both
4	102	---	SE1	104	---	SE1	118	350	Both
5	97	---	SE1	103	---	SE1	121	160	Lower
Average	96	---	---	106	---	---	119	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/23/24		
Tested By:	est	Report #:	7
Checked By:	dln	Page:	5 of 9

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-62	Machine ID:	717
Seam ID:	171/172	Welder ID:	CO
		Date Sampled:	07/22/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	108	---	SE1	106	---	SE1	115	160	Lower
2	105	---	SE1	102	---	SE1	117	220	Lower
3	106	---	SE1	107	---	SE1	118	240	Lower
4	107	---	SE1	107	---	SE1	117	170	Lower
5	106	---	SE1	107	---	SE1	117	220	Lower
Average	106	---	---	106	---	---	117	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS
A SERCEL COMPANY

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/23/24		
Tested By:	est	Report #:	7
Checked By:	dln	Page:	6 of 9

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-63	Machine ID:	86
Seam ID:	172/173	Welder ID:	OD
		Date Sampled:	07/22/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	98	---	SE1	102	---	SE1	117	160	Lower
2	96	---	SE1	103	---	SE1	114	170	Lower
3	103	---	SE1	106	---	SE1	118	160	Lower
4	104	---	SE1	101	---	SE1	117	160	Lower
5	101	---	SE1	104	---	SE1	119	160	Lower
Average	100	---	---	103	---	---	117	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%. Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS
A SERCEL COMPANY

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/23/24		
Tested By:	est	Report #:	7
Checked By:	dln	Page:	7 of 9

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-64	Machine ID:	86
Seam ID:	172/173	Welder ID:	OD
		Date Sampled:	07/22/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	103	---	SE1	104	---	SE1	119	160	Lower
2	99	---	SE1	98	---	SE1	115	190	Lower
3	98	---	SE1	103	---	SE1	115	220	Lower
4	92	---	SE1	102	---	SE1	112	170	Lower
5	101	---	SE1	97	---	SE1	116	150	Lower
Average	99	---	---	101	---	---	115	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%. Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS
A SERCEL COMPANY

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/23/24		
Tested By:	est	Report #:	7
Checked By:	dln	Page:	8 of 9

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-65	Machine ID:	717
Seam ID:	173/174	Welder ID:	CO
		Date Sampled:	07/22/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	99	---	SE1	102	---	SE1	119	170	Lower
2	97	---	SE1	101	---	SE1	115	210	Lower
3	100	---	SE1	104	---	SE1	118	260	Lower
4	107	---	SE1	99	---	SE1	115	180	Lower
5	100	---	SE1	96	---	SE1	117	190	Lower
Average	100	---	---	100	---	---	117	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/23/24		
Tested By:	est	Report #:	7
Checked By:	dln	Page:	9 of 9

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-66	Machine ID:	717
Seam ID:	173/174	Welder ID:	CO
		Date Sampled:	07/22/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	91	---	SE1	96	---	SE1	120	180	Lower
2	90	---	SE1	94	---	SE1	120	120	Lower
3	92	---	SE1	97	---	SE1	120	150	Upper
4	88	---	SE1	93	---	SE1	117	100	Upper
5	90	---	SE1	93	---	SE1	119	110	Upper
Average	90	---	---	94	---	---	119	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/29/24		
Tested By:	est	Report #:	8
Checked By:	dln	Page:	1 of 10

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-67	Machine ID:	86
Seam ID:	178/179	Welder ID:	OD
		Date Sampled:	07/26/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	96	---	SE1	81	---	SE1	120	180	Upper
2	90	---	SE1	82	---	SE1	120	280	Both
3	94	---	SE1	91	---	SE1	121	180	Lower
4	95	---	SE1	80	---	SE1	118	110	Lower
5	85	---	SE1	85	---	SE1	122	130	Lower
Average	92	---	---	84	---	---	120	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%. Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/29/24		
Tested By:	est	Report #:	8
Checked By:	dln	Page:	2 of 10

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-68	Machine ID:	717
Seam ID:	172/173	Welder ID:	CO
		Date Sampled:	07/26/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	78	---	SE1	86	---	SE1	124	130	Upper
2	83	---	SE1	83	---	SE1	124	130	Upper
3	78	---	SE1	86	---	SE1	126	100	Lower
4	76	---	SE1	84	---	SE1	123	140	Upper
5	81	---	SE1	88	---	SE1	126	130	Upper
Average	79	---	---	85	---	---	125	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%. Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/29/24		
Tested By:	est	Report #:	8
Checked By:	dln	Page:	3 of 10

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-69	Machine ID:	86
Seam ID:	181/182	Welder ID:	OD
		Date Sampled:	07/26/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	81	---	SE1	100	---	SE1	126	120	Lower
2	77	---	SE1	91	---	SE1	122	130	Upper
3	77	---	SE1	98	---	SE1	125	110	Lower
4	81	---	SE1	98	---	SE1	123	130	Lower
5	81	---	SE1	93	---	SE1	122	140	Lower
Average	80	---	---	96	---	---	124	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%. Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/29/24		
Tested By:	est	Report #:	8
Checked By:	dln	Page:	4 of 10

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-70	Machine ID:	717
Seam ID:	174/184	Welder ID:	CO
		Date Sampled:	07/26/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	100	---	SE1	88	---	SE1	124	180	Lower
2	98	---	SE1	89	---	SE1	124	140	Upper
3	96	---	SE1	87	---	SE1	125	110	Upper
4	96	---	SE1	84	---	SE1	116	130	Upper
5	100	---	SE1	83	---	SE1	124	110	Upper
Average	98	---	---	86	---	---	122	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%. Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS
A SERCEL COMPANY

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/29/24		
Tested By:	est	Report #:	8
Checked By:	dln	Page:	5 of 10

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-71	Machine ID:	717
Seam ID:	182/185	Welder ID:	CO
		Date Sampled:	07/26/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	89	---	SE1	86	---	SE1	127	150	Upper
2	92	---	SE1	86	---	SE1	125	180	Upper
3	91	---	SE1	87	---	SE1	125	120	Lower
4	87	---	SE1	93	---	SE1	123	120	Lower
5	87	---	SE1	84	---	SE1	123	100	Lower
Average	89	---	---	87	---	---	125	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%. Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/29/24		
Tested By:	est	Report #:	8
Checked By:	dln	Page:	6 of 10

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-72	Machine ID:	86
Seam ID:	184/187	Welder ID:	OD
		Date Sampled:	07/26/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	105	---	SE1	108	---	SE1	124	230	Both
2	102	---	SE1	105	---	SE1	122	190	Upper
3	107	---	SE1	107	---	SE1	124	140	Upper
4	102	---	SE1	104	---	SE1	121	160	Upper
5	99	---	SE1	103	---	SE1	122	170	Upper
Average	103	---	---	106	---	---	123	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%. Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS
A SERCEL COMPANY

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/29/24		
Tested By:	est	Report #:	8
Checked By:	dln	Page:	7 of 10

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-73	Machine ID:	86
Seam ID:	185/186	Welder ID:	OD
		Date Sampled:	07/26/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	81	---	SE1	90	---	SE1	121	110	Lower
2	80	---	SE1	87	---	SE1	121	170	Lower
3	85	---	SE1	101	---	SE1	119	110	Lower
4	83	---	SE1	91	---	SE1	120	160	Lower
5	79	---	SE1	91	---	SE1	120	150	Lower
Average	82	---	---	92	---	---	120	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%. Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS
A SERCEL COMPANY

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/29/24		
Tested By:	est	Report #:	8
Checked By:	dln	Page:	8 of 10

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-74	Machine ID:	717
Seam ID:	186/187	Welder ID:	CO
		Date Sampled:	07/26/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	93	---	SE1	95	---	SE1	109	170	Lower
2	93	---	SE1	98	---	SE1	104	120	Lower
3	95	---	SE1	93	---	SE1	102	110	Lower
4	98	---	SE1	96	---	SE1	108	130	Lower
5	95	---	SE1	98	---	SE1	105	160	Lower
Average	95	---	---	96	---	---	106	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%. Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS
A SERCEL COMPANY

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/29/24		
Tested By:	est	Report #:	8
Checked By:	dln	Page:	9 of 10

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE	Testing Speed:	20 in/min
Seaming Method:	Fillet Extrusion Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-75	Machine ID:	613
Seam ID:	79/176	Welder ID:	FR
		Date Sampled:	07/26/24

Specimen Number	Peel Strength						Shear Strength		
	Weld A			Weld B					
	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	94	---	SE3	---	---	---	100	190	Lower
2	90	---	SE3	---	---	---	98	270	Lower
3	85	---	SE3	---	---	---	94	300	Lower
4	91	---	SE3	---	---	---	99	360	Both
5	94	---	SE3	---	---	---	93	150	Lower
Average	91	---	---	---	---	---	97	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%. Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

GeoTesting EXPRESS
A SERCEL COMPANY

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/29/24		
Tested By:	est	Report #:	8
Checked By:	dln	Page:	10 of 10

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE	Testing Speed:	20 in/min
Seaming Method:	Fillet Extrusion Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-76	Machine ID:	616
Seam ID:	71/187	Welder ID:	CO
		Date Sampled:	07/26/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	107	---	SE3	---	---	---	95	380	Both
2	89	---	SE3	---	---	---	94	410	Both
3	79	---	SE3	---	---	---	98	390	Both
4	93	---	SE3	---	---	---	93	270	Both
5	96	---	SE3	---	---	---	95	320	Both
Average	93	---	---	---	---	---	95	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/31/24		
Tested By:	est	Report #:	9
Checked By:	dln	Page:	1 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-77	Machine ID:	717
Seam ID:	186/189	Welder ID:	CO
		Date Sampled:	07/30/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	81	---	SE1	99	---	SE1	119	140	Upper
2	81	---	SE1	93	---	SE1	116	140	Lower
3	83	---	SE1	97	---	SE1	117	140	Lower
4	81	---	SE1	95	---	SE1	117	160	Upper
5	82	---	SE1	94	---	SE1	121	150	Lower
Average	82	---	---	96	---	---	118	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/31/24		
Tested By:	est	Report #:	9
Checked By:	dln	Page:	2 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-78	Machine ID:	39
Seam ID:	189/191	Welder ID:	OD
		Date Sampled:	07/30/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	90	---	SE1	98	---	SE1	117	80	Upper
2	95	---	SE1	99	---	SE1	119	140	Upper
3	91	---	SE1	100	---	SE1	122	120	Upper
4	93	---	SE1	96	---	SE1	116	100	Upper
5	93	---	SE1	98	---	SE1	122	270	Both
Average	92	---	---	98	---	---	119	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/31/24		
Tested By:	est	Report #:	9
Checked By:	dln	Page:	3 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-79	Machine ID:	717
Seam ID:	191/193	Welder ID:	CO
		Date Sampled:	07/30/24

Specimen Number	Peel Strength						Shear Strength		
	Weld A			Weld B					
	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	91	---	SE1	92	---	SE1	120	130	Upper
2	79	---	SE1	91	---	SE1	119	140	Upper
3	75	---	SE1	91	---	SE1	121	130	Lower
4	77	---	SE1	86	---	SE1	119	210	Both
5	79	---	SE1	88	---	SE1	121	140	Lower
Average	80	---	---	89	---	---	120	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/31/24		
Tested By:	est	Report #:	9
Checked By:	dln	Page:	4 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-80	Machine ID:	717
Seam ID:	191/193	Welder ID:	CO
		Date Sampled:	07/30/24

Specimen Number	Peel Strength						Shear Strength		
	Weld A			Weld B					
	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	86	---	SE1	101	---	SE1	122	130	Lower
2	81	---	SE1	104	---	SE1	124	160	Upper
3	83	---	SE1	105	---	SE1	126	140	Lower
4	82	---	SE1	105	---	SE1	122	140	Upper
5	94	---	SE1	103	---	SE1	125	130	Lower
Average	85	---	---	103	---	---	124	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/31/24		
Tested By:	est	Report #:	9
Checked By:	dln	Page:	5 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-81	Machine ID:	39
Seam ID:	193/195	Welder ID:	OD
		Date Sampled:	07/30/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	91	---	SE1	97	---	SE1	101	110	Upper
2	89	---	SE1	94	---	SE1	120	160	Upper
3	89	---	SE1	95	---	SE1	113	180	Upper
4	92	---	SE1	96	---	SE1	120	40	Upper
5	100	---	SE1	95	---	SE1	120	100	Upper
Average	92	---	---	95	---	---	115	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/31/24		
Tested By:	est	Report #:	9
Checked By:	dln	Page:	6 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-82	Machine ID:	39
Seam ID:	195/196	Welder ID:	OD
		Date Sampled:	07/30/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	86	---	SE1	96	---	SE1	112	160	Upper
2	96	---	SE1	96	---	SE1	112	190	Upper
3	93	---	SE1	98	---	SE1	113	170	Upper
4	84	---	SE1	94	---	SE1	108	340	Both
5	85	---	SE1	96	---	SE1	111	140	Upper
Average	89	---	---	96	---	---	111	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/31/24		
Tested By:	est	Report #:	9
Checked By:	dln	Page:	7 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-83	Machine ID:	39
Seam ID:	195/196	Welder ID:	OD
		Date Sampled:	07/30/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	93	---	SE1	98	---	SE1	117	160	Lower
2	91	---	SE1	99	---	SE1	118	270	Both
3	98	---	SE1	102	---	SE1	118	170	Lower
4	105	---	SE1	101	---	SE1	118	160	Lower
5	99	---	SE1	99	---	SE1	119	150	Lower
Average	97	---	---	100	---	---	118	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/31/24		
Tested By:	est	Report #:	9
Checked By:	dln	Page:	8 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-84	Machine ID:	717
Seam ID:	197/198	Welder ID:	CO
		Date Sampled:	07/30/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	89	---	SE1	87	---	SE1	92	140	Upper
2	86	---	SE1	85	---	SE1	93	320	Both
3	87	---	SE1	84	---	SE1	93	390	Both
4	85	---	SE1	87	---	SE1	94	230	Both
5	88	---	SE1	88	---	SE1	97	300	Both
Average	87	---	---	86	---	---	94	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/31/24		
Tested By:	est	Report #:	9
Checked By:	dln	Page:	9 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-85	Machine ID:	39
Seam ID:	193/199	Welder ID:	OD
		Date Sampled:	07/30/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	100	---	SE1	94	---	SE1	121	180	Lower
2	104	---	SE1	95	---	SE1	118	220	Lower
3	105	---	SE1	98	---	SE1	121	160	Lower
4	101	---	SE1	93	---	SE1	118	190	Lower
5	101	---	SE1	91	---	SE1	121	240	Both
Average	102	---	---	94	---	---	120	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/31/24		
Tested By:	est	Report #:	9
Checked By:	dln	Page:	10 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-86	Machine ID:	717
Seam ID:	199/202	Welder ID:	CO
		Date Sampled:	07/30/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	86	---	SE1	103	---	SE1	122	220	Lower
2	96	---	SE1	102	---	SE1	121	230	Lower
3	93	---	SE1	101	---	SE1	121	240	Lower
4	94	---	SE1	100	---	SE1	119	180	Lower
5	91	---	SE1	98	---	SE1	124	180	Lower
Average	92	---	---	101	---	---	122	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/31/24		
Tested By:	est	Report #:	9
Checked By:	dln	Page:	11 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-87	Machine ID:	39
Seam ID:	202/203	Welder ID:	OD
		Date Sampled:	07/30/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	88	---	SE1	101	---	SE1	116	150	Lower
2	87	---	SE1	100	---	SE1	114	200	Lower
3	93	---	SE1	108	---	SE1	115	210	Lower
4	92	---	SE1	101	---	SE1	114	170	Lower
5	89	---	SE1	101	---	SE1	118	160	Lower
Average	90	---	---	102	---	---	116	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/31/24		
Tested By:	est	Report #:	9
Checked By:	dln	Page:	12 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE	Testing Speed:	20 in/min
Seaming Method:	Fillet Extrusion Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-88	Machine ID:	616
Seam ID:	114/193	Welder ID:	ID
		Date Sampled:	07/30/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	109	---	SE3	---	---	---	106	360	Both
2	98	---	SE3	---	---	---	100	380	Both
3	94	---	SE3	---	---	---	96	160	Lower
4	108	---	SE3	---	---	---	101	380	Both
5	99	---	SE3	---	---	---	98	480	Both
Average	102	---	---	---	---	---	100	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	07/31/24		
Tested By:	est	Report #:	9
Checked By:	dln	Page:	13 of 13

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE	Testing Speed:	20 in/min
Seaming Method:	Fillet Extrusion Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-89	Machine ID:	613
Seam ID:	Existing/203	Welder ID:	FR
		Date Sampled:	07/30/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	97	---	SE3	---	---	---	97	180	Upper
2	91	---	SE3	---	---	---	98	350	Both
3	92	---	SE3	---	---	---	98	340	Both
4	95	---	SE3	---	---	---	94	150	Upper
5	96	---	SE3	---	---	---	97	260	Both
Average	94	---	---	---	---	---	97	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	09/20/24		
Tested By:	es/gc	Report #:	10
Checked By:	dln	Page:	1 of 12

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-90	Machine ID:	39
Seam ID:	206/208	Welder ID:	FR
		Date Sampled:	09/17/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	110	---	SE1	92	---	SE1	119	210	Upper
2	104	---	SE1	93	---	SE1	112	240	Upper
3	106	---	SE1	94	---	SE1	115	170	Lower
4	108	---	SE1	97	---	SE1	117	170	Lower
5	110	---	SE1	95	---	SE1	121	180	Lower
Average	108	---	---	94	---	---	117	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	09/20/24		
Tested By:	es/gc	Report #:	10
Checked By:	dln	Page:	2 of 12

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-91	Machine ID:	717
Seam ID:	203/212	Welder ID:	CO
		Date Sampled:	09/17/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	104	---	SE1	88	---	SE1	124	180	Lower
2	85	---	SE1	82	---	SE1	121	210	Lower
3	97	---	SE1	85	---	SE1	122	180	Lower
4	99	---	SE1	88	---	SE1	119	170	Lower
5	104	---	SE1	83	---	SE1	124	160	Lower
Average	98	---	---	85	---	---	122	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	09/20/24		
Tested By:	es/gc	Report #:	10
Checked By:	dln	Page:	3 of 12

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-92	Machine ID:	717
Seam ID:	211/213	Welder ID:	CO
		Date Sampled:	09/17/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	94	---	SE1	102	---	SE1	121	190	Lower
2	95	---	SE1	98	---	SE1	122	130	Lower
3	98	---	SE1	103	---	SE1	119	140	Lower
4	101	---	SE1	101	---	SE1	125	130	Lower
5	106	---	SE1	101	---	SE1	128	130	Lower
Average	99	---	---	101	---	---	123	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	09/20/24		
Tested By:	es/gc	Report #:	10
Checked By:	dln	Page:	4 of 12

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-93	Machine ID:	39
Seam ID:	214/215	Welder ID:	FR
		Date Sampled:	09/17/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	97	---	SE1	110	---	SE1	122	160	Lower
2	94	---	SE1	108	---	SE1	121	240	Lower
3	95	---	SE1	111	---	SE1	110	350	Lower
4	99	---	SE1	110	---	SE1	122	160	Lower
5	89	---	SE1	108	---	SE1	123	180	Lower
Average	95	---	---	109	---	---	120	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	09/20/24		
Tested By:	es/gc	Report #:	10
Checked By:	dln	Page:	5 of 12

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-94	Machine ID:	39
Seam ID:	213/215	Welder ID:	FR
		Date Sampled:	09/17/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	95	---	SE1	109	---	SE1	118	180	Upper
2	96	---	SE1	108	---	SE1	121	180	Upper
3	90	---	SE1	110	---	SE1	125	140	Upper
4	96	---	SE1	109	---	SE1	122	140	Upper
5	94	---	SE1	109	---	SE1	114	140	Upper
Average	94	---	---	109	---	---	120	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	09/20/24		
Tested By:	es/gc	Report #:	10
Checked By:	dln	Page:	6 of 12

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-95	Machine ID:	717
Seam ID:	215/216	Welder ID:	CO
		Date Sampled:	09/17/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	80	---	SE1	102	---	SE1	122	110	Upper
2	84	---	SE1	103	---	SE1	121	190	Upper
3	98	---	SE1	106	---	SE1	123	180	Upper
4	102	---	SE1	100	---	SE1	123	160	Upper
5	102	---	SE1	105	---	SE1	123	160	Upper
Average	93	---	---	103	---	---	122	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	09/20/24		
Tested By:	es/gc	Report #:	10
Checked By:	dln	Page:	7 of 12

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-96	Machine ID:	717
Seam ID:	215/216	Welder ID:	CO
		Date Sampled:	09/17/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	105	---	SE1	96	---	SE1	122	100	Upper
2	108	---	SE1	101	---	SE1	122	130	Lower
3	110	---	SE1	103	---	SE1	123	130	Upper
4	107	---	SE1	100	---	SE1	124	130	Upper
5	108	---	SE1	102	---	SE1	122	130	Upper
Average	108	---	---	100	---	---	123	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	09/20/24		
Tested By:	es/gc	Report #:	10
Checked By:	dln	Page:	8 of 12

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-97	Machine ID:	39
Seam ID:	216/218	Welder ID:	FR
		Date Sampled:	09/17/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	107	---	SE1	90	---	SE1	123	110	Upper
2	108	---	SE1	89	---	SE1	121	210	Lower
3	105	---	SE1	92	---	SE1	123	260	Lower
4	108	---	SE1	89	---	SE1	124	140	Lower
5	107	---	SE1	91	---	SE1	125	180	Lower
Average	107	---	---	90	---	---	123	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	09/20/24		
Tested By:	es/gc	Report #:	10
Checked By:	dln	Page:	9 of 12

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-98	Machine ID:	717
Seam ID:	219/222	Welder ID:	CO
		Date Sampled:	09/17/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	100	---	SE1	98	---	SE1	127	270	Both
2	100	---	SE1	99	---	SE1	124	110	Lower
3	103	---	SE1	100	---	SE1	124	160	Upper
4	105	---	SE1	92	---	SE1	124	80	Lower
5	107	---	SE1	98	---	SE1	125	140	Upper
Average	103	---	---	98	---	---	125	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	09/20/24		
Tested By:	es/gc	Report #:	10
Checked By:	dln	Page:	10 of 12

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-99	Machine ID:	---
Seam ID:	218/222	Welder ID:	---
		Date Sampled:	09/17/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	98	---	SE1	97	---	SE1	122	110	Upper
2	103	---	SE1	99	---	SE1	121	160	Lower
3	105	---	SE1	85	---	SE1	121	130	Lower
4	104	---	SE1	91	---	SE1	123	110	Lower
5	104	---	SE1	81	---	SE1	123	140	Upper
Average	103	---	---	91	---	---	122	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	09/20/24		
Tested By:	es/gc	Report #:	10
Checked By:	dln	Page:	11 of 12

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE (smooth edge)	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-100	Machine ID:	39
Seam ID:	222/225	Welder ID:	FR
		Date Sampled:	09/17/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	100	---	SE1	91	---	SE1	125	110	Upper
2	87	---	SE1	99	---	SE1	118	180	Lower
3	85	---	SE1	104	---	SE1	117	190	Lower
4	86	---	SE1	98	---	SE1	115	180	Lower
5	103	---	SE1	85	---	SE1	119	160	Lower
Average	92	---	---	95	---	---	119	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
Installer:	---		
GTX #:	319059		
Test Date:	09/20/24		
Tested By:	es/gc	Report #:	10
Checked By:	dln	Page:	12 of 12

Integrity of Nonreinforced Geomembrane Seams Produced Using Thermo-Fusion Methods by ASTM D6392

peel & shear destructive test

Upper Geomembrane:	40 mil Agru microspike LLDPE	Testing Machine:	Instron 1123
Lower Geomembrane:	40 mil Agru microspike LLDPE	Testing Speed:	20 in/min
Seaming Method:	Dual Hot Wedge Weld	Grips:	ATS pneumatic
		Specimen Size:	1 in x 8 in

Sample ID:	DT-101	Machine ID:	---
Seam ID:	224/225	Welder ID:	---
		Date Sampled:	09/17/24

	Peel Strength						Shear Strength		
	Weld A			Weld B					
Specimen Number	lb./in	Seam Separation, %	Failure Type	lb./in	Seam Separation, %	Failure Type	lb./in	Elongation, %	Rupture Mode
1	94	---	SE1	96	---	SE1	114	270	Upper
2	97	---	SE1	97	---	SE1	105	270	Both
3	120	---	SE1	102	---	SE1	112	260	Both
4	93	---	SE1	93	---	SE1	105	260	Both
5	95	---	SE1	105	---	SE1	114	370	Both
Average	100	---	---	98	---	---	110	---	---

Comments:

Estimate of seam separation visually determined based upon area of separated bond to the nearest 5%.

Shear test halted for HDPE and LMDPE materials once specimen has elongated 50%.
Shear test halted for PVC, fPP, LLDPE, VFPE and VLDPE once specimen has elongated past machine capacity.

Rupture mode for specimens with >50% elongation (HDPE and LMDPE) or > machine capacity (PVC, fPP, LLDPE, VFPE and VLDPE) interpreted as occurring in the membrane that exhibits yielding.

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Appendix G-3 Panel Layout Plan

New England Liner Systems, Inc. — *Panel Placement Form*

Project: *Ledge Road Landfill*
2024 Closure
Andover, MA

Product: *40 Mill LLDPE*

Date	*Panel Number*	*Roll Number*	*Panel Length*	*Panel Width*	*sq. ft.*	*Comments*
6/12/2024	*P-1*	*0035*	*207'*	*23'*		
6/12/2024	*P-2*	*0035*	*211'*	*23'*		
6/12/2024	*P-3*	*0035*	*220'*	*23'*		
6/12/2024	*P-4*	*0035*	*97'*	*23'*		
6/12/2024	*P-5*	*0066*	*134'*	*23'*		
6/12/2024	*P-6*	*0066*	*239'*	*23'*		
6/12/2024	*P-7*	*0066*	*251'*	*23'*		
6/12/2024	*P-8*	*0066*	*107'*	*23'*		
6/12/2024	*P-9*	*0030*	*152'*	*23'*		
6/12/2024	*P-10*	*0030*	*270'*	*23'*		
6/12/2024	*P-11*	*0030*	*272'*	*23'*		
6/12/2024	*P-12*	*0030*	*50'*	*23'*		
6/12/2024	*P-13*	*0057*	*228'*	*23'*		
6/12/2024	*P-14*	*0057*	*283'*	*23'*		
6/12/2024	*P-15*	*0057*	*233'*	*23'*		
6/12/2024	*P-16*	*0006*	*54'*	*23'*		
6/12/2024	*P-17*	*0006*	*285'*	*23'*		
6/12/2024	*P-18*	*0006*	*289'*	*23'*		
6/12/2024	*P-19*	*0006*	*109'*	*23'*		
6/12/2024	*P-20*	*0063*	*174'*	*23'*		
6/12/2024	*P-21*	*0063*	*264'*	*23'*		
6/12/2024	*P-22*	*0063*	*249'*	*23'*		
6/13/2024	*P-23*	*0025*	*17'*	*7'*		

New England Liner Systems, Inc. — *Panel Placement Form*

Project: *Ledge Road Landfill*
2024 Closure
Andover, MA

Product: *40 Mill LLDPE*

Date	*Panel Number*	*Roll Number*	*Panel Length*	*Panel Width*	*sq. ft.*	*Comments*
6/13/2024	*P-24*	*0025*	*30'*	*23'*		
6/13/2024	*P-25*	*0025*	*58'*	*23'*		
6/13/2024	*P-26*	*0025*	*84'*	*23'*		
6/13/2024	*P-27*	*0011*	*63'*	*23'*		
6/13/2024	*P-28*	*0025*	*48'*	*23'*		
6/13/2024	*P-29*	*0011*	*136'*	*23'*		
6/13/2024	*P-30*	*0011*	*126'*	*23'*		
6/13/2024	*P-31*	*0063*	*40'*	*23'*		
6/13/2024	*P-32*	*0011*	*193'*	*23'*		
6/13/2024	*P-33*	*0011*	*201'*	*23'*		
6/13/2024	*P-34*	*0025*	*200'*	*23'*		
6/13/2024	*P-35*	*0025*	*210'*	*23'*		
6/13/2024	*P-36*	*0025*	*85'*	*23'*		
6/13/2024	*P-37*	*0067*	*137'*	*23'*		
6/13/2024	*P-38*	*0067*	*227'*	*23'*		
6/13/2024	*P-39*	*0067*	*234'*	*23'*		
6/13/2024	*P-40*	*0067*	*142'*	*23'*		
6/13/2024	*P-41*	*0027*	*96'*	*23'*		
6/13/2024	*P-42*	*0027*	*239'*	*23'*		
6/13/2024	*P-43*	*0027*	*234'*	*23'*		
6/13/2024	*P-44*	*0027*	*168'*	*23'*		
6/13/2024	*P-45*	*0001*	*63'*	*23'*		
6/13/2024	*P-46*	*0001*	*41'*	*15'*		

New England Liner Systems, Inc. — *Panel Placement Form*

Project: *Ledge Road Landfill*
2024 Closure
Andover, MA

Product: *40 Mill LLDPE*

Date	*Panel Number*	*Roll Number*	*Panel Length*	*Panel Width*	*sq. ft.*	*Comments*
6/13/2024	*P-47*	*0001*	*68'*	*23'*		
6/13/2024	*P-48*	*0001*	*64'*	*23'*		
6/13/2024	*P-49*	*0001*	*63'*	*23'*		
6/13/2024	*P-50*	*0001*	*183'*	*23'*		
6/13/2024	*P-51*	*0001*	*208'*	*23'*		
6/13/2024	*P-52*	*0001*	*59'*	*23'*		
6/13/2024	*P-53*	*0028*	*145'*	*23'*		
6/13/2024	*P-54*	*0028*	*203'*	*23'*		
6/14/2024	*P-55*	*0028*	*200'*	*23'*		
6/14/2024	*P-56*	*0028*	*195'*	*23'*		
6/14/2024	*P-57*	*0032*	*193'*	*23'*		
6/14/2024	*P-58*	*0032*	*192'*	*23'*		
6/14/2024	*P-59*	*0032*	*191'*	*23'*		
6/14/2024	*P-60*	*0032*	*165'*	*23'*		
6/14/2024	*P-61*	*0070*	*25'*	*23'*		
6/14/2024	*P-62*	*0070*	*193'*	*23'*		
6/14/2024	*P-63*	*0070*	*192'*	*23'*		
6/14/2024	*P-64*	*0070*	*192'*	*23'*		
6/14/2024	*P-65*	*0070*	*136'*	*23'*		
6/14/2024	*P-66*	*0037*	*57'*	*23'*		
6/14/2024	*P-67*	*0037*	*196'*	*23'*		
6/14/2024	*P-68*	*0037*	*194'*	*23'*		
6/14/2024	*P-69*	*0037*	*195'*	*23'*		

New England Liner Systems, Inc. — *Panel Placement Form*

Project: *Ledge Road Landfill*
2024 Closure
Andover, MA

Product: *40 Mill LLDPE*

Date	*Panel Number*	*Roll Number*	*Panel Length*	*Panel Width*	*sq. ft.*	*Comments*
6/18/2024	*P-70*	*0037*	*103'*	*23'*		
6/18/2024	*P-71*	*0074*	*91'*	*23'*		
6/18/2024	*P-72*	*0074*	*193'*	*23'*		
6/18/2024	*P-73*	*0074*	*194'*	*23'*		
6/18/2024	*P-74*	*0074*	*198'*	*23'*		
6/18/2024	*P-75*	*0074*	*60'*	*23'*		
6/18/2024	*P-76*	*0073*	*144'*	*23'*		
6/18/2024	*P-77*	*0073*	*208'*	*23'*		
6/18/2024	*P-78*	*0073*	*213'*	*23'*		
6/18/2024	*P-79*	*0073*	*189'*	*23'*		
6/18/2024	*P-80*	*0069*	*32'*	*23'*		
6/18/2024	*P-81*	*0069*	*226'*	*23'*		
6/18/2024	*P-82*	*0069*	*230'*	*23'*		
6/19/2024	*P-83*	*0069*	*245'*	*23'*		
6/19/2024	*P-84*	*0064*	*243'*	*23'*		
6/19/2024	*P-85*	*0064*	*15'*	*7'*		
6/19/2024	*P-86*	*0064*	*43'*	*23'*		
6/19/2024	*P-87*	*0064*	*80'*	*23'*		
6/19/2024	*P-88*	*0064*	*132'*	*23'*		
6/19/2024	*P-89*	*0064*	*180'*	*23'*		
6/19/2024	*P-90*	*0064*	*46'*	*23'*		
6/19/2024	*P-91*	*0055*	*188'*	*23'*		
6/19/2024	*P-92*	*0055*	*248'*	*23'*		

New England Liner Systems, Inc. — *Panel Placement Form*

Project: *Ledge Road Landfill*
2024 Closure
Andover, MA

Product: *40 Mill LLDPE*

Date	*Panel Number*	*Roll Number*	*Panel Length*	*Panel Width*	*sq. ft.*	*Comments*
6/19/2024	*P-93*	*0055*	*248'*	*23'*		
6/20/2024	*P-94*	*0033*	*253'*	*23'*		
6/20/2024	*P-95*	*0033*	*203'*	*23'*		
6/20/2024	*P-96*	*0055*	*174'*	*23'*		
6/20/2024	*P-97*	*0033*	*32'*	*13'*		
6/20/2024	*P-98*	*0020*	*115'*	*23'*		
6/20/2024	*P-99*	*0020*	*29'*	*9'*		
6/20/2024	*P-100*	*0020*	*49'*	*23'*		
6/20/2024	*P-101*	*0033*	*94'*	*23'*		
6/20/2024	*P-102*	*0020*	*99'*	*23'*		
6/20/2024	*P-103*	*0020*	*220'*	*23'*		
6/20/2024	*P-104*	*0020*	*215'*	*23'*		
6/20/2024	*P-105*	*0020*	*30'*	*23'*		
6/20/2024	*P-106*	*0009*	*177'*	*23'*		
6/20/2024	*P-107*	*0009*	*200'*	*23'*		
6/20/2024	*P-108*	*0009*	*193'*	*23'*		
6/25/2024	*P-109*	*0009*	*163'*	*23'*		
6/25/2024	*P-110*	*0042*	*26'*	*23'*		
6/25/2024	*P-111*	*0042*	*180'*	*23'*		
6/25/2024	*P-112*	*0042*	*173'*	*23'*		
6/25/2024	*P-113*	*0042*	*166'*	*23'*		
6/25/2024	*P-114*	*0042*	*162'*	*23'*		
6/25/2024	*P-115*	*0042*	*26'*	*23'*		

New England Liner Systems, Inc. — *Panel Placement Form*

Project: *Ledge Road Landfill*
2024 Closure
Andover, MA

Product: *40 Mill LLDPE*

Date	*Panel Number*	*Roll Number*	*Panel Length*	*Panel Width*	*sq. ft.*	*Comments*
6/25/2024	*P-116*	*0004*	*131'*	*23'*		
6/25/2024	*P-117*	*0004*	*152'*	*23'*		
6/25/2024	*P-118*	*0004*	*148'*	*23'*		
6/25/2024	*P-119*	*0004*	*109'*	*23'*		
6/25/2024	*P-120*	*0072*	*23'*	*23'*		
6/25/2024	*P-121*	*0072*	*108'*	*23'*		
6/25/2024	*P-122*	*0072*	*88'*	*23'*		
6/25/2024	*P-123*	*0072*	*54'*	*23'*		
6/25/2024	*P-124*	*0072*	*30'*	*23'*		
6/25/2024	*P-125*	*0004*	*193'*	*23'*		
6/26/2024	*P-126*	*0072*	*209'*	*23'*		
6/26/2024	*P-127*	*0072*	*216'*	*23'*		
6/26/2024	*P-128*	*0015*	*8'*	*23'*		
6/26/2024	*P-129*	*0015*	*230'*	*23'*		
6/26/2024	*P-130*	*0015*	*241'*	*23*		
6/26/2024	*P-131*	*0015*	*247'*	*23'*		
6/26/2024	*P-132*	*0024*	*252'*	*23'*		
6/26/2024	*P-133*	*0024*	*257'*	*23'*		
6/26/2024	*P-134*	*0024*	*240'*	*23'*		
6/26/2024	*P-135*	*0050*	*20'*	*23'*		
6/27/2024	*P-136*	*0050*	*264'*	*23'*		
6/27/2024	*P-137*	*0050*	*263'*	*23'*		
6/27/2024	*P-138*	*0050*	*188'*	*23'*		

New England Liner Systems, Inc. — *Panel Placement Form*

Project: *Ledge Road Landfill*
2024 Closure
Andover, MA

Product: *40 Mill LLDPE*

Date	*Panel Number*	*Roll Number*	*Panel Length*	*Panel Width*	*sq. ft.*	*Comments*
6/27/2024	*P-139*	*0062*	*77'*	*23'*		
6/27/2024	*P-140*	*0062*	*268'*	*23'*		
6/27/2024	*P-141*	*0062*	*277'*	*23'*		
6/27/2024	*P-142*	*0062*	*125'*	*23'*		
6/27/2024	*P-143*	*0019*	*158'*	*23'*		
6/27/2024	*P-144*	*0019*	*284'*	*23'*		
6/27/2024	*P-145*	*0019*	*280'*	*23'*		
6/27/2024	*P-146*	*0019*	*29'*	*23'*		
6/27/2024	*P-147*	*0040*	*245'*	*23'*		
6/28/2024	*P-148*	*0040*	*260'*	*23'*		
6/28/2024	*P-149*	*0040*	*240'*	*23'*		
6/28/2024	*P-150*	*0010*	*11'*	*23'*		
6/28/2024	*P-151*	*0010*	*233'*	*23'*		
6/28/2024	*P-152*	*0010*	*219'*	*23'*		
6/28/2024	*P-153*	*0010*	*205'*	*23'*		
6/28/2024	*P-154*	*0010*	*71'*	*23'*		
6/28/2024	*P-155*	*0068*	*123'*	*23'*		
6/28/2024	*P-156*	*0068*	*179'*	*23'*		
6/28/2024	*P-157*	*0068*	*161'*	*23'*		
6/28/2024	*P-158*	*0068*	*138'*	*23'*		
6/28/2024	*P-159*	*0068*	*97'*	*23'*		
6/28/2024	*P-160*	*0068*	*34'*	*23'*		
7/18/2024	*P-161*	*0013*	*21'*	*7'*		

New England Liner Systems, Inc. — *Panel Placement Form*

Project: *Ledge Road Landfill*
2024 Closure
Andover, MA

Product: *40 Mill LLDPE*

Date	*Panel Number*	*Roll Number*	*Panel Length*	*Panel Width*	*sq. ft.*	*Comments*
7/18/2024	*P-162*	*0013*	*21'*	*7'*		
7/18/2024	*P-163*	*0013*	*438'*	*23'*		
7/19/2024	*P-164*	*0054*	*84'*	*13'*		
7/19/2024	*P-165*	*0054*	*109'*	*23'*		
7/19/2024	*P-166*	*0005*	*476'*	*23'*		
7/19/2024	*P-167*	*0054*	*596'*	*23'*		
7/22/2024	*P-168*	*0036*	*610'*	*23'*		
7/22/2024	*P-169*	*0059*	*615'*	*23'*		
7/22/2024	*P-170*	*0008*	*624'*	*23'*		
7/22/2024	*P-171*	*0041*	*634'*	*23'*		
7/22/2024	*P-172*	*0056*	*642'*	*23'*		
7/22/2024	*P-173*	*0012*	*584'*	*23'*		
7/22/2024	*P-174*	*0034*	*595'*	*23'*		
7/25/2024	*P-168*	*0036*	*140'*	*23'*		
7/25/2024	*P-169*	*0059*	*135'*	*23'*		
7/25/2024	*P-170*	*0008*	*129'*	*23'*		
7/25/2024	*P-171*	*0041*	*118'*	*23'*		
7/25/2024	*P-172*	*0056*	*105'*	*23'*		
7/25/2024	*P-173*	*0012*	*166'*	*23'*		
7/25/2024	*P-174*	*0034*	*151'*	*23'*		
7/25/2024	*P-175*	*0003*	*103'*	*23'*		
7/25/2024	*P-176*	*0003*	*31'*	*23'*		
7/25/2024	*P-177*	*0003*	*83'*	*23'*		

New England Liner Systems, Inc. — *Panel Placement Form*

Project: *Ledge Road Landfill*
2024 Closure
Andover, MA

Product: *40 Mill LLDPE*

Date	*Panel Number*	*Roll Number*	*Panel Length*	*Panel Width*	*sq. ft.*	*Comments*
7/25/2024	*P-178*	*0003*	*104'*	*23'*		
7/25/2024	*P-179*	*0003*	*112'*	*23'*		
7/25/2024	*P-180*	*0003*	*120'*	*23'*		
7/25/2024	*P-181*	*0003*	*130'*	*23'*		
7/25/2024	*P-182*	*0003*	*63'*	*23'*		
7/25/2024	*P-183*	*0018*	*84'*	*23'*		
7/25/2024	*P-184*	*0026*	*738'*	*23'*		
7/25/2024	*P-185*	*0018*	*170'*	*23'*		
7/25/2024	*P-186*	*0018*	*495'*	*23'*		
7/25/2024	*P-187*	*0007*	*421'*	*23'*		
7/25/2024	*P-188*	*0007*	*323'*	*23'*		
7/29/2024	*P-189*	*#0017*	*607'*	*23'*		
7/29/2024	*P-190*	*#0017*	*131'*	*23'*		
7/29/2024	*P-191*	*#0038*	*747'*	*23'*		
7/29/2024	*P-192*	*#0065*	*70'*	*23'*		
7/29/2024	*P-193*	*#0065*	*672'*	*23'*		
7/29/2024	*P-194*	*#0045*	*282'*	*23'*		
7/29/2024	*P-195*	*#0045*	*464'*	*23'*		
7/29/2024	*P-196*	*#0053*	*419'*	*23'*		
7/29/2024	*P-197*	*#0053*	*60'*	*12'*		
7/29/2024	*P-198*	*#0053*	*79'*	*8'*		
7/30/2024	*P-199*	*#0045*	*263'*	*23'*		
7/30/2024	*P-200*	*#0043*	*225'*	*23'*		

New England Liner Systems, Inc. — *Panel Placement Form*

Project: *Ledge Road Landfill*
2024 Closure
Andover, MA

Product: *40 Mill LLDPE*

Date	*Panel Number*	*Roll Number*	*Panel Length*	*Panel Width*	*sq. ft.*	*Comments*
7/30/2024	*P-201*	*#0043*	*7'*	*23'*		
7/30/2024	*P-202*	*#0043*	*525'*	*23'*		
7/30/2024	*P-203*	*#0071*	*528'*	*23'*		
9/17/24..	*P-204*	*#0021*	*209'*	*23'*		
9/17/24..	*P-205*	*#0021*	*211'*	*23'*		
9/17/24..	*P-206*	*#0046*	*188'*	*23'*		
9/17/24..	*P-207*	*#0049*	*22'*	*23'*		
9/17/24..	*P-208*	*#0046*	*117'*	*23'*		
9/17/24..	*P-209*	*#0049*	*90'*	*23'*		
9/17/24..	*P-210*	*#0049*	*42'*	*23'*		
9/17/24..	*P-211*	*#0046*	*427'*	*23'*		
9/17/24..	*P-212*	*#0021*	*271'*	*23'*		
9/17/24..	*P-213*	*#0049*	*558'*	*23'*		
9/17/24..	*P-214*	*#0061*	*93'*	*23'*		
9/17/24..	*P-215*	*#0061*	*641'*	*23'*		
9/17/24..	*P-216*	*#0029*	*605'*	*23'*		
9/17/24..	*P-217*	*#0029*	*127'*	*23'*		
9/17/24..	*P-218*	*#0023*	*452'*	*23'*		
9/17/24..	*P-219*	*#0023*	*292'*	*23'*		
9/17/24..	*P-220*	*#0049*	*11'*	*5'*		
9/17/24..	*P-221*	*#0016*	*267'*	*23'*		
9/17/24..	*P-222*	*#0016*	*515'*	*23'*		
9/17/24..	*P-223*	*#0016*	*14'*	*10'*		

New England Liner Systems, Inc. — *Panel Placement Form*

Project: *Ledge Road Landfill*
2024 Closure
Andover, MA

Product: *40 Mill LLDPE*

Date	*Panel Number*	*Roll Number*	*Panel Length*	*Panel Width*	*sq. ft.*	*Comments*
9/17/24..	*P-224*	*#0044*	*309'*	*23'*		
9/17/24..	*P-225*	*#0016*	*160'*	*23'*		
10/8/2024	*P-226*	*#0044*	*18'*	*23'*		
10/8/2024	*P-227*	*#0044*	*30'*	*23'*		
10/8/2024	*P-228*	*#0044*	*126'*	*23'*		
10/8/2024	*P-229*	*#0047*	*131'*	*23'*		
10/8/2024	*P-230*	*#0047*	*137'*	*23'*		
10/8/2024	*P-231*	*#0047*	*135'*	*23'*		
10/8/2024	*P-232*	*#0047*	*139'*	*23'*		
10/8/2024	*P-233*	*#0047*	*143'*	*23'*		
10/8/2024	*P-234*	*#0047*	*46'*	*23'*		
10/8/2024	*P-235*	*#0060*	*101'*	*23'*		
10/8/2024	*P-236*	*#0060*	*143'*	*23'*		
10/8/2024	*P-237*	*#0060*	*130'*	*23'*		
10/8/2024	*P-238*	*#0060*	*117'*	*23'*		
10/8/2024	*P-239*	*#0060*	*110'*	*23'*		
10/8/2024	*P-240*	*#0060*	*90'*	*23'*		
10/8/2024	*P-241*	*#0002*	*20'*	*23'*		
10/8/2024	*P-242*	*#0002*	*100'*	*23'*		
10/8/2024	*P-243*	*#0002*	*89'*	*23'*		
10/8/2024	*P-244*	*#0002*	*75'*	*23'*		
10/8/2024	*P-245*	*#0002*	*62'*	*23'*		
10/8/2024	*P-246*	*#0002*	*52'*	*23'*		

New England Liner Systems, Inc. ***Panel Placement Form***

Project: *Ledge Road Landfill*
2024 Closure
Andover, MA

Product: *40 Mill LLDPE*

Date	*Panel Number*	*Roll Number*	*Panel Length*	*Panel Width*	*sq. ft.*	*Comments*
10/8/2024	*P-247*	*#0002*	*37'*	*23'*		
10/8/2024	*P-248*	*#0002*	*22'*	*23'*		

Appendix G-4 Trial Weld Log

New England Liner Systems, Inc.

Trial Weld

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 mill LLDPE*

			EXTRUSION WELDER		FUSION WELDER							
DATE	MACH. NUMBER	SEAMER INITIALS	BARREL TEMP	PREHEAT SETTING	WEDGE TEMP	SPEED FT/MIN	TEST MODE	SAMPLE NUMBER 1	2	3	4	PASS FAIL
6/12/24. 8:22	717	C.O			800	650	PEEL	84/72	74/74	78/84	82/84	
							SHEAR	98	99	95	N/A	PASS
6/12/24. 8:30	86	O.D			830	650	PEEL	83/85	80/84	92/86	85/84	
							SHEAR	99	101	96	N/A	PASS
6/12/24. 8:57	717	C.O			800	630	PEEL	85/81	85/83	84/79	85/80	
							SHEAR	89	88	92	N/A	PASS
6/12/24. 12:45	86	O.D			830	650	PEEL	73/73	69/74	69/72	72/77	
							SHEAR	87	88	90	N/A	PASS
6/12/24. 12:46	717	C.O			800	670	PEEL	69/67	70/77	79/78	77/80	
							SHEAR	88	90	89	N/A	PASS
6/12/24. 12:49	717	C.O			800	650	PEEL	73/80	74/76	72/78	73/77	
							SHEAR	82	80	85	N/A	PASS
6/12/24. 2:25	616	C.O	480	300			PEEL	74	74	76	73	
							SHEAR	76	75	77	N/A	PASS
6/13/24. 7:21	86	O.D			830	650	PEEL	73/74	81/80	83/84	77/72	
							SHEAR	97	98	95	N/A	PASS
6/13/24. 7:19	717	C.O			830	650	PEEL	72/73	77/90	78/78	78/81	
							SHEAR	92	97	89	N/A	PASS
6/13/24. 7:21	717	C.O			830	630	PEEL	78/76	79/79	80/80	81/85	
							SHEAR	89	90	79	N/A	PASS
6/13/24. 12:43	717	C.O			830	650	PEEL	78/78	74/79	74/80	79/77	
							SHEAR	84	84	87	N/A	PASS
6/13/24. 12:46	717	C.O			830	630	PEEL	79/80	75/74	73/76	75/78	
							SHEAR	79	84	78	N/A	PASS
6/13/24. 12:48	86	O.D			830	650	PEEL	82/81	83/80	77/78	78/80	
							SHEAR	94	104	89	N/A	PASS
6/13/24. 2:03	616	C.O	480	300			PEEL	72	74	76	72	
							SHEAR	80	79	83	N/A	PASS
6/14/24. 7:17	717	C.O			800	670	PEEL	84/79	83/81	77/78	86/85	
							SHEAR	89	91	95	N/A	PASS
6/14/24. 7:18	86	O.D			830	650	PEEL	77/77	89/85	80/80	81/86	
							SHEAR	103	96	95	N/A	PASS
6/14/24. 7:22	717	C.O			800	660	PEEL	83/76	83/83	86/86	82/88	
							SHEAR	93	97	94	N/A	PASS
6/14/24. 10:40	616	C.O	500	400			PEEL	82	83	80	82	
							SHEAR	90	91	100	N/A	PASS
6/14/24. 10:56	613	O.D	500	480			PEEL	85	90	85	73	
							SHEAR	84	77	87	N/A	PASS
6/17/24. 7:20	613	C.O	500	480			PEEL	83	82	86	93	
							SHEAR	91	96	103	N/A	PASS
6/18/24. 9:35	717	C.O			800	680	PEEL	69/69	69/71	68/71	67/72	
							SHEAR	76	78	84	N/A	PASS
6/18/24. 9:39	717	C.O			800	670	PEEL	76/84	80/84	82/83	85/87	
							SHEAR	87	88	85	N/A	PASS
6/18/24. 9:38	86	O.D			830	650	PEEL	77/74	79/80	75/79	80/78	
							SHEAR	92	88	84	N/A	PASS
6/18/24. 2:01	613	C.O	500	480			PEEL	83	87	85	90	
							SHEAR	91	95	90	N/A	PASS
6/19/24. 7:30	86	O.D			800	700	PEEL	79/82	80/86	78/79	77/80	
							SHEAR	92	97	96	N/A	PASS

New England Liner Systems, Inc.

Trial Weld

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 mill LLDPE*

		EXTRUSION WELDER			FUSION WELDER							
DATE	MACH. NUMBER	SEAMER INITIALS	BARREL TEMP	PREHEAT SETTING	WEDGE TEMP	SPEED FT/MIN	TEST MODE	SAMPLE NUMBER 1	2	3	4	PASS FAIL
							PEEL	85/75	85/82	88/75	76/75	
6/19/24. 7:25	717	C.O			800	700	SHEAR	93	97	99	N/A	PASS
							PEEL	79/81	82/81	75/81	79/84	
6/19/24. 8:33	717	C.O			800	650	SHEAR	88	89	89	N/A	PASS
							PEEL	72/72	74/79	72/73	76/75	
6/19/24. 12:49	717	C.O			800	750	SHEAR	80	83	78	N/A	PASS
							PEEL	69/73	74/78	71/77	77/84	
6/19/24. 12:45	86	O.D			800	750	SHEAR	79	81	85	N/A	PASS
							PEEL	73/82	75/82	76/78	77/83	
6/20/24. 6:43	86	O.D			800	700	SHEAR	92	93	91	N/A	PASS
							PEEL	80/76	71/73	74/74	77/85	
6/20/24. 6:52	717	C.O			800	700	SHEAR	91	93	90	N/A	PASS
							PEEL	69/73	70/72	76/75	77/78	
6/20/24. 6:57	717	C.O			800	650	SHEAR	84	85	85	N/A	PASS
							PEEL	82	76	83	80	
6/20/24. 12:42	613	C.O	500	450			SHEAR	86	83	86	N/A	PASS
							PEEL	81	76	77	82	
6/20/24. 12:46	616	O.D	500	450			SHEAR	97	88	90	N/A	PASS
							PEEL	88	77	79	84	
6/21/24. 6:22	616	C.O	500	450			SHEAR	89	86	88	N/A	PASS
							PEEL	89	90	91	87	
6/21/24. 6:21	613	F.R	500	450			SHEAR	98	95	93	N/A	PASS
							PEEL	88	86	90	88	
6/25/24. 7:38	616	C.O	500	450			SHEAR	96	96	95	N/A	PASS
							PEEL	76/74	74/74	70/75	71/69	
6/25/24. 8:28	717	C.O			800	730	SHEAR	87	89	89	N/A	PASS
							PEEL	71/71	72/69	73/70	76/70	
6/25/24. 8:20	86	O.D			800	700	SHEAR	87	88	86	N/A	PASS
							PEEL	69/69	70/72	68/71	70/74	
6/25/24. 8:23	717	C.O			800	700	SHEAR	79	86	89	N/A	PASS
							PEEL	67/66	68/70	65/65	70/68	
6/25/24. 12:07	717	C.O			800	750	SHEAR	79	82	79	N/A	PASS
							PEEL	75/72	79/79	75/75	72/71	
6/25/24. 12:18	86	O.D			800	700	SHEAR	81	86	89	N/A	PASS
							PEEL	69/70	70/75	70/69	70/70	
6/25/24. 1:00	717	C.O			800	650	SHEAR	78	79	75	N/A	PASS
							PEEL	83/76	84/84	73/69	85/84	
6/26/24. 6:08	717	C.O			850	700	SHEAR	90	95	92	N/A	PASS
							PEEL	86/84	89/86	79/80	83/84	
6/26/24. 6:12	86	O.D			800	700	SHEAR	94	95	95	N/A	PASS
							PEEL	76/73	78/80	79/75	80/78	
6/26/24. 6:14	717	C.O			800	650	SHEAR	88	90	93	N/A	PASS
							PEEL	65	69	70	71	
6/26/24. 9:41	616	C.O	500	300			SHEAR	78	76	70	N/A	PASS
							PEEL	76	78	78	78	
6/26/24. 10:56	613	F.R	450	400			SHEAR	87	84	84	N/A	PASS
							PEEL	75/69	74/75	70/69	75/73	
6/26/24. 12:52	717	C.O			800	750	SHEAR	84	86	80	N/A	PASS
							PEEL	79/87	82/87	78/84	80/84	
6/27/24. 8:03	86	O.D			800	700	SHEAR	95	100	90	N/A	PASS

New England Liner Systems, Inc.

Trial Weld

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 mill LLDPE*

		EXTRUSION WELDER			FUSION WELDER							
	MACH.	SEAMER	BARREL	PREHEAT	WEDGE	SPEED	TEST	SAMPLE NUMBER				PASS
DATE	NUMBER	INITIALS	TEMP	SETTING	TEMP	FT/MIN	MODE	1	2	3	4	FAIL
							PEEL	79/73	78/84	73/72	81/85	
6/27/24. 8:00	717	C.O			800	700	SHEAR	99	95	96	N/A	PASS
							PEEL	82/83	85/84	85/84	83/89	
6/27/24. 8:05	717	C.O			800	650	SHEAR	88	89	88	N/A	PASS
							PEEL	73/74	72/85	71/72	74/73	
6/27/24. 12:35	86	O.D			800	700	SHEAR	86	89	92	N/A	PASS
							PEEL	73/71	74/71	74/70	76/74	
6/27/24. 12:36	717	C.O			800	750	SHEAR	89	87	90	N/A	PASS
							PEEL	89/79	92/87	80/80	85/80	
6/28/24. 7:28	717	C.O			800	700	SHEAR	105	105	105	N/A	PASS
							PEEL	86/89	85/92	88/83	85/93	
6/28/24. 7:30	86	O.D			800	700	SHEAR	99	106	101	N/A	PASS
							PEEL	78/78	79/79	80/80	83/85	
6/28/24. 7:30	717	C.O			800	650	SHEAR	90	93	90	N/A	PASS
							PEEL	82	84	84	80	
6/28/24. 11:01	616	C.O	500	300			SHEAR	92	97	99	N/A	PASS
							PEEL	84	86	86	80	
6/28/24. 11:38	613	O.D	500	400			SHEAR	90	97	94	N/A	PASS
							PEEL	83	84	79	76	
7/18/24. 7:45	613	F.R	500	400			SHEAR	89	90	88	N/A	PASS
							PEEL	89	90	81	82	
7/18/24. 8:43	616	C.O	500	300			SHEAR	96	93	91	N/A	PASS
							PEEL	80	86	78	80	
7/18/24. 12:46	613	F.R	500	450			SHEAR	90	90	86	N/A	PASS
							PEEL	82	80	82	79	
7/18/24. 12:48	616	C.O	500	300			SHEAR	91	88	90	N/A	PASS
							PEEL	76/75	77/73	78/72	75/77	
7/18/24. 12:50	86	O.D			800	6.5	SHEAR	90	88	91	N/A	PASS
							PEEL	85	80	87	85	
7/19/24. 7:20	616	C.O	500	350			SHEAR	95	102	100	N/A	PASS
							PEEL	85	79	83	85	
7/19/24. 7:34	613	F.R	500	400			SHEAR	93	96	89	N/A	PASS
							PEEL	75/73	76/79	73/73	79/75	
7/19/24. 12:44	717	C.O			800	6.5	SHEAR	83	85	83	N/A	PASS
							PEEL	77/70	78/85	81/80	83/82	
7/19/24. 12:49	86	O.D			800	7.0	SHEAR	95	96	92	N/A	PASS
							PEEL	83	82	80	83	
7/19/24. 12:52	613	F.R	500	400			SHEAR	90	88	88	N/A	PASS
							PEEL	81	78	80	82	
7/19/24. 2:00	616	C.O	500	350			SHEAR	94	100	98	N/A	PASS
							PEEL	85/77	85/80	82/78	86/84	
7/22/24. 7:18	717	C.O			800	7.0	SHEAR	94	95	95	N/A	PASS
							PEEL	82/80	84/82	75/81	89/83	
7/22/24. 7:24	86	O.D			800	7.0	SHEAR	88	98	98	N/A	PASS
							PEEL	84	84	81	83	
7/22/24. 7:28	613	F.R	500	400			SHEAR	90	91	95	N/A	PASS
							PEEL	83	85	75	76	
7/22/24. 12:53	613	F.R	450	320			SHEAR	85	88	86	N/A	PASS
							PEEL	74/74	74/75	72/74	79/78	
7/22/24. 12:45	86	O.D			800	7.0	SHEAR	80	83	84	N/A	PASS

New England Liner Systems, Inc.

Trial Weld

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 mill LLDPE*

		EXTRUSION WELDER			FUSION WELDER							
DATE	MACH. NUMBER	SEAMER INITIALS	BARREL TEMP	PREHEAT SETTING	WEDGE TEMP	SPEED FT/MIN	TEST MODE	SAMPLE NUMBER 1	2	3	4	PASS FAIL
							PEEL	70/70	76/72	69/74	72/76	
7/22/24. 1:09	717	C.O			800	7.5	SHEAR	85	88	89	N/A	PASS
							PEEL	78/94	82/86	80/80	84/84	
7/25/24. 7:12	717	C.O			800	6.5	SHEAR	95	96	95	N/A	PASS
							PEEL	81/84	82/84	84/82	81/90	
7/25/24. 7:15	86	O.D			800	7.0	SHEAR	117	107	110	N/A	PASS
							PEEL	89	92	86	87	
7/25/24. 7:52	613	F.R	500	450			SHEAR	90	89	88	N/A	PASS
							PEEL	80/80	85/78	81/80	83/80	
7/25/24. 8:11	717	C.O			800	6.3	SHEAR	90	94	92	N/A	PASS
							PEEL	70/70	73/75	74/73	75/75	
7/25/24. 11:50	717	C.O			800	6.5	SHEAR	92	92	93	N/A	PASS
							PEEL	82/78	78/88	74/79	76/77	
7/25/24. 11:40	86	O.D			800	7.0	SHEAR	99	110	108	N/A	PASS
							PEEL	88	83	86	89	
7/26/24. 7:17	616	C.O	520	330			SHEAR	90	91	90	N/A	PASS
							PEEL	86/82	87/83	83/83	86/87	
7/29/24. 7:26	717	C.O			800	6.5	SHEAR	100	101	112	N/A	PASS
							PEEL	90/91	93/89	87/90	86/94	
7/29/24. 7:24	39	O.D			800	6.5	SHEAR	103	105	112	N/A	PASS
							PEEL	81	84	85	81	
7/29/24. 9:01	613	F.R	500	450			SHEAR	89	90	86	N/A	PASS
							PEEL	84	88	89	91	
7/30/24. 7:23	613	F.R	500	450			SHEAR	93	95	93	N/A	PASS
							PEEL	84	86	80	81	
7/30/24. 7:40	616	C.O	500	350			SHEAR	88	90	93	N/A	PASS
							PEEL	72/73	70/70	70/70	72/76	
7/30/24. 11:20	717	C.O			800	6.7	SHEAR	88	89	86	N/A	PASS
							PEEL	73/75	78/81	77/80	78/82	
7/30/24. 11:22	39	O.D			800	6.5	SHEAR	93	95	90	N/A	PASS
							PEEL	80/71	82/76	71/70	73/72	
7/30/24. 11:36	717	C.O			800	6.4	SHEAR	88	83	88	N/A	PASS
							PEEL	84/92	88/94	81/84	89/92	
9/17/24. 7:58	717	C.O			800	6.2	SHEAR	100	102	99	N/A	PASS
							PEEL	79/88	81/92	87/93	86/86	
9/17/24. 8:17	39	F.R			800	5.7	SHEAR	99	100	99	N/A	PASS
							PEEL	86	79	89	N/A	
9/17/24. 8:16	613	E.G	505	470			SHEAR	90	93	94	N/A	PASS
							PEEL	73/86	77/87	80/89	84/92	
9/17/24. 8:40	717	C.O			800	6.0	SHEAR	94	96	95	N/A	PASS
							PEEL	79	80	78	79	
9/17/24. 10:29	616	P.O	470	390			SHEAR	84	81	80	N/A	PASS
							PEEL	79/77	78/79	76/75	76/75	
9/17/24. 12:40	717	C.O			800	6.6	SHEAR	88	87	88	N/A	PASS
							PEEL	70/74	75/78	75/75	77/75	
9/17/24. 12:41	39	F.R			800	6.3	SHEAR	85	86	82	N/A	PASS
							PEEL	73	76	74	77	
9/17/24. 12:49	613	E.G	500	470			SHEAR	80	81	79	N/A	PASS
							PEEL	78	79	77	78	
9/17/24. 3:31	616	P.O	470	390			SHEAR	80	80	83	N/A	PASS

New England Liner Systems, Inc.

Trial Weld

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 mill LLDPE*

			EXTRUSION WELDER		FUSION WELDER							
DATE	*MACH. NUMBER*	*SEAMER INITIALS*	*BARREL TEMP*	*PREHEAT SETTING*	*WEDGE TEMP*	*SPEED FT/MIN*	*TEST MODE*	*SAMPLE NUMBER 1*	*2*	*3*	*4*	PASS FAIL
							PEEL	*69/71*	*76/75*	*77/71*	*69/76*	
9/17/24. 4:46	*39*	*F.R*			*800*	*6.3*	*SHEAR*	*86*	*87*	*80*	*N/A*	PASS
							PEEL	*78/70*	*76/69*	*76/77*	*70/78*	
9/17/24. 4:49	*717*	*C.O*			*800*	*6.6*	*SHEAR*	*89*	*88*	*86*	*N/A*	PASS
							PEEL	*85*	*86*	*78*	*80*	
9/17/24. 5:01	*613*	*E.G*	*500*	*470*			*SHEAR*	*86*	*88*	*79*	*N/A*	PASS
							PEEL	*99/91*	*94/92*	*97/89*	*97/94*	
10/8/2024	*123*	*P.O*			*800*	*5.5*	*SHEAR*	*111*	*112*	*117*	*N/A*	PASS
							PEEL	*98/89*	*94/97*	*90/93*	*95/97*	
10/8/2024	*239*	*C.M*			*800*	*5.5*	*SHEAR*	*113*	*112*	*114*	*N/A*	PASS
							PEEL	*88*	*89*	*88*	*87*	
10/8/2024	*695*	*E.G*	*505*	*480*			*SHEAR*	*104*	*101*	*98*	*N/A*	PASS

Appendix G-5 Panel Seaming and Repair Report

New England Liner Systems, Inc. — *Panel Seaming Form*

PRODUCT: *40 Mill LLDPE*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

DATE	*SEAM NUMBER*	*SEAMER INITIALS*	*MACHINE #*	*SEAM LENGTH*	*COMMENTS*
6/12/2024	*P-1/P-2*	*C.O*	*717*	*206'*	*8:26*
6/12/2024	*P-2/P-3*	*O.D*	*86*	*212'*	*8:35*
6/12/2024	*P-3/P-4*	*O.D*	*86*	*91'*	*9:16*
6/12/2024	*P-3/P-5*	*O.D*	*86*	*132'*	*9:02*
6/12/2024	*P-4/P-5*	*C.O*	*717*	*23'*	*9:00*
6/12/2024	*P-4/P-6*	*C.O*	*717*	*99'*	
6/12/2024	*P-5/P-6*	*C.O*	*717*	*134'*	*9:05*
6/12/2024	*P-6/P-7*	*O.D*	*86*	*243'*	*9:33*
6/12/2024	*P-7/P-8*	*C.O*	*717*	*104'*	
6/12/2024	*P-7/P-9*	*C.O*	*717*	*149'*	*9:42*
6/12/2024	*P-8/P-10*	*O.D*	*86*	*113'*	*10:22*
6/12/2024	*P-8/P-9*	*C.O*	*717*	*23'*	*9:39*
6/12/2024	*P-9/P-10*	*O.D*	*86*	*150'*	*10:06*
6/12/2024	*P-10/P-11*	*C.O*	*717*	*270'*	*10:19*
6/12/2024	*P-11/P-12*	*O.D*	*86*	*50'*	*10:42*
6/12/2024	*P-11/P-13*	*O.D*	*86*	*226'*	*10:48*
6/12/2024	*P-12/P-13*	*C.O*	*717*	*23'*	*10:14*
6/12/2024	*P-12/P-14*	*C.O*	*717*	*47'*	*10:52*
6/12/2024	*P-13/P-14*	*C.O*	*717*	*228'*	
6/12/2024	*P-14/P-15*	*O.D*	*86*	*230'*	*11:28*
6/12/2024	*P-14/P-16*	*O.D*	*86*	*52'*	*11:21*
6/12/2024	*P-15/P-16*	*C.O*	*717*	*23'*	*11:01*

New England Liner Systems, Inc. — *Panel Seaming Form*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM NUMBER*	*SEAMER INITIALS*	*MACHINE #*	*SEAM LENGTH*	*COMMENTS*
6/12/2024	*P-15/P-17*	*C.O*	*717*	*234'*	
6/12/2024	*P-16/P-17*	*C.O*	*717*	*52'*	*11:38*
6/12/2024	*P-17/P-18*	*O.D*	*86*	*288'*	*12:47*
6/12/2024	*P-18/P-19*	*O.D*	*86*	*115'*	*1:13*
6/12/2024	*P-18/P-20*	*O.D*	*86*	*170'*	*1:27*
6/12/2024	*P-19/P-20*	*C.O*	*717*	*23'*	
6/12/2024	*P-19/P-21*	*C.O*	*717*	*101'*	
6/12/2024	*P-20/P-21*	*C.O*	*717*	*169'*	*1:34*
6/12/2024	*P-21/P-22*	*O.D*	*86*	*255'*	
6/13/2024	*P-22/P-23*	*C.O*	*717*	*10'*	
6/13/2024	*P-23/P-24*	*O.D*	*86*	*12'*	*9:04*
6/13/2024	*P-22/P-24*	*C.O*	*717*	*33'*	
6/13/2024	*P-24/P-25*	*O.D*	*86*	*37'*	*9:02*
6/13/2024	*P-22/P-25*	*C.O*	*717*	*30'*	
6/13/2024	*P-25/P-26*	*O.D*	*86*	*66'*	*8:47*
6/13/2024	*P-22/P-26*	*C.O*	*717*	*32'*	
6/13/2024	*P-26/P-27*	*O.D*	*86*	*51'*	*8:30*
6/13/2024	*P-22/P-27*	*C.O*	*717*	*32'*	
6/13/2024	*P-26/P-28*	*O.D*	*86*	*44'*	*8:34*
6/13/2024	*P-27/P-28*	*C.O*	*717*	*23'*	*8:19*
6/13/2024	*P-28/P-29*	*C.O*	*717*	*50'*	
6/13/2024	*P-27/P-29*	*C.O*	*717*	*74'*	*8:25*
6/13/2024	*P-22/P-29*	*C.O*	*717*	*32'*	

New England Liner Systems, Inc. — *Panel Seaming Form*

PRODUCT: *40 Mill LLDPE*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

DATE	*SEAM NUMBER*	*SEAMER INITIALS*	*MACHINE #*	*SEAM LENGTH*	*COMMENTS*
6/13/2024	*P-29/P-30*	*O.D*	*86*	*112'*	*8:05*
6/13/2024	*P-29/P-31*	*O.D*	*86*	*38'*	*8:18*
6/13/2024	*P-30/P-31*	*C.O*	*717*	*23'*	*9:58*
6/13/2024	*P-22/P-30*	*C.O*	*717*	*32'*	
6/13/2024	*P-30/P-32*	*C.O*	*717*	*134'*	*7:49*
6/13/2024	*P-31/P-32*	*C.O*	*717*	*43'*	
6/13/2024	*P-22/P-32*	*C.O*	*717*	*32'*	*8:46*
6/13/2024	*P-32/P-33*	*O.D*	*86*	*208'*	*7:35*
6/13/2024	*P-33/P-34*	*O.D*	*86*	*192'*	*9:16*
6/13/2024	*P-34/P-35*	*C.O*	*717*	*200'*	*9:16*
6/13/24	*P-35/P-36*	*O.D*	*86*	*83'*	*10:04*
6/13/24	*P-35/P-37*	*O.D*	*86*	*131'*	*9:51*
6/13/24	*P-36/P-37*	*C.O*	*717*	*23'*	*9:42*
6/13/24	*P-36/P-38*	*C.O*	*717*	*86'*	
6/13/24	*P-37/P-38*	*C.O*	*717*	*135'*	*9:50*
6/13/24	*P-38/P-39*	*O.D*	*86*	*227'*	*10:20*
6/13/24	*P-39/P-40*	*C.O*	*717*	*143'*	
6/13/24	*P-40/P-41*	*C.O*	*717*	*23'*	*10:18*
6/13/24	*P-39/P-41*	*C.O*	*717*	*93'*	*10:23*
6/13/24	*P-40/P-42*	*O.D*	*86*	*142'*	
6/13/24	*P-41/P-42*	*O.D*	*86*	*97'*	*10:58*
6/13/24	*P-42/P-43*	*C.O*	*717*	*235'*	*10:53*
6/13/24	*P-43/P-44*	*O.D*	*86*	*174'*	*11:44*

New England Liner Systems, Inc. — *Panel Seaming Form*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM NUMBER*	*SEAMER INITIALS*	*MACHINE #*	*SEAM LENGTH*	*COMMENTS*
6/13/24	P-43/P-45	O.D	86	60'	11:38
6/13/24	P-44/P-46	C.O	717	41'	
6/13/24	P-46/P-47	C.O	717	40'	11:58
6/13/24	P-44/P-47	C.O	717	61'	
6/13/24	P-47/P-48	C.O	717	64'	
6/13/24	P-48/P-49	C.O	717	23'	11:39
6/13/24	P-47/P-49	C.O	717	30'	
6/13/24	P-44/P-49	C.O	717	62'	
6/13/24	P-44/P-45	C.O	717	23'	11:27
6/13/24	P-48/P-50	C.O	717	64'	
6/13/24	P-49/P-50	C.O	717	87'	12:50
6/13/24	P-45/P-50	C.O	717	60'	1:10
6/13/24	P-50/P-51	O.D	86	208'	12:52
6/13/24	P-51/P-52	O.D	86	59'	1:36
6/13/24	P-52/P-53	C.O	717	23'	1:41
6/13/24	P-51/P-53	O.D	86	148'	1:20
6/13/24	P-52/P-54	C.O	717	58'	
6/13/24	P-53/P-54	C.O	717	148'	1:47
6/14/24	P-54/P-55	O.D	86	202'	7:21
6/14/24	P-55/P-56	C.O	717	200'	7:24
6/14/24	P-56/P-57	O.D	86	197'	7:55
6/14/24	P-57/P-58	C.O	717	193'	7:58
6/14/24	P-58/P-59	O.D	86	191'	8:26

New England Liner Systems, Inc. — *Panel Seaming Form*

PRODUCT: *40 Mill LLDPE*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

DATE	*SEAM NUMBER*	*SEAMER INITIALS*	*MACHINE #*	*SEAM LENGTH*	*COMMENTS*
6/14/24	*P-59/P-60*	*C.O*	*717*	*164'*	
6/14/24	*P-59/P-61*	*C.O*	*717*	*28'*	*8:29*
6/14/24	*P-60/P-61*	*C.O*	*717*	*23'*	*8:24*
6/14/24	*P-60/P-62*	*O.D*	*86*	*167'*	*8:58*
6/14/24	*P-61/P-62*	*O.D*	*86*	*27'*	*8:56*
6/14/24	*P-62/P-63*	*C.O*	*717*	*192'*	*8:55*
6/14/24	*P-63/P-64*	*O.D*	*86*	*192'*	*9:23*
6/14/24	*P-64/P-65*	*C.O*	*717*	*136'*	
6/14/24	*P-64/P-66*	*C.O*	*717*	*60'*	*9:24*
6/14/24	*P-65/P-66*	*C.O*	*717*	*23'*	*9:19*
6/14/24	*P-66/P-67*	*O.D*	*86*	*60'*	*9:50*
6/14/24	*P-65/P-67*	*O.D*	*86*	*137'*	
6/14/24	*P-67/P-68*	*C.O*	*717*	*193'*	*9:50*
6/14/24	*P-68/P-69*	*C.O*	*717*	*195'*	*10:14*
6/18/2024	*P-69/P-70*	*O.D*	*86*	*103'*	
6/18/2024	*P-69/P-71*	*O.D*	*86*	*89'*	*9:45*
6/18/2024	*P-70/P-72*	*C.O*	*717*	*103'*	
6/18/2024	*P-71/P-72*	*C.O*	*717*	*90'*	*10:41*
6/18/2024	*P-72/P-73*	*O.D*	*86*	*193'*	*10:50*
6/18/2024	*P-73/P-74*	*C.O*	*717*	*194'*	*11:11*
6/18/2024	*P-70/P-71*	*C.O*	*717*	*23'*	
6/18/2024	*P-74/P-75*	*O.D*	*86*	*58'*	*11:42*
6/18/2024	*P-74/P-76*	*O.D*	*86*	*140'*	*11:24*

New England Liner Systems, Inc. — *Panel Seaming Form*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM NUMBER*	*SEAMER INITIALS*	*MACHINE #*	*SEAM LENGTH*	*COMMENTS*
6/18/2024	*P-75/P-76*	*C.O*	*717*	*23'*	
6/18/2024	*P-75/P-77*	*C.O*	*717*	*60'*	
6/18/2024	*P-76/P-77*	*C.O*	*717*	*145'*	*12:35*
6/18/2024	*P-77/P-78*	*O.D*	*86*	*209'*	*12:49*
6/18/2024	*P-78/P-79*	*C.O*	*717*	*185'*	*1:06*
6/18/2024	*P-78/P-80*	*C.O*	*717*	*31'*	
6/18/2024	*P-79/P-80*	*C.O*	*717*	*23'*	
6/18/2024	*P-79/P-81*	*O.D*	*86*	*190'*	*1:28*
6/18/2024	*P-80/P-81*	*O.D*	*86*	*32'*	
6/18/2024	*P-81/P-82*	*C.O*	*717*	*228'*	
6/19/2024	*P-82/P-83*	*O.D*	*86*	*232'*	*8:57*
6/19/2024	*P-83/P-84*	*C.O*	*717*	*238'*	*8:58*
6/19/2024	*P-84/P-85*	*C.O*	*717*	*15'*	
6/19/2024	*P-84/P-86*	*C.O*	*717*	*43'*	
6/19/2024	*P-84/P-87*	*C.O*	*717*	*44'*	
6/19/2024	*P-84/P-88*	*C.O*	*717*	*47'*	
6/19/2024	*P-84/P-89*	*C.O*	*717*	*50'*	*11:08*
6/19/2024	*P-84/P-90*	*C.O*	*717*	*42'*	*11:56*
6/19/2024	*P-85/P-86*	*C.O*	*717*	*15'*	*10:49*
6/19/2024	*P-86/P-87*	*C.O*	*717*	*55'*	*10:40*
6/19/2024	*P-87/P-88*	*O.D*	*86*	*106'*	*10:20*
6/19/2024	*P-88/P-89*	*C.O*	*717*	*155'*	*10:09*
6/19/2024	*P-89/P-90*	*O.D*	*86*	*21'*	*11:45*

New England Liner Systems, Inc. — *Panel Seaming Form*

PRODUCT: *40 Mill LLDPE*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

DATE	*SEAM NUMBER*	*SEAMER INITIALS*	*MACHINE #*	*SEAM LENGTH*	*COMMENTS*
6/19/2024	*P-89/P-91*	*O.D*	*86*	*182'*	
6/19/2024	*P-90/P-91*	*C.O*	*717*	*23'*	*11:40*
6/19/2024	*P-90/P-92*	*C.O*	*717*	*60'*	*1:08*
6/19/2024	*P-91/P-92*	*C.O*	*717*	*188'*	
6/19/2024	*P-92/P-93*	*O.D*	*86*	*248'*	*2:10*
6/20/2024	*P-93/P-94*	*O.D*	*86*	*253'*	*8:15*
6/20/2024	*P-94/P-95*	*C.O*	*717*	*203'*	*8:22*
6/20/2024	*P-95/P-96*	*O.D*	*86*	*196'*	*8:47*
6/20/2024	*P-96/P-97*	*C.O*	*717*	*32'*	
6/20/2024	*P-96/P-98*	*C.O*	*717*	*124'*	*8:51*
6/20/2024	*P-97/P-98*	*C.O*	*717*	*13'*	*9:06*
6/20/2024	*P-98/P-99*	*O.D*	*86*	*29'*	
6/20/2024	*P-99/P-100*	*C.O*	*717*	*9'*	*9:14*
6/20/2024	*P-98/P-100*	*O.D*	*86*	*60'*	*9:13*
6/20/2024	*P-100/P-101*	*C.O*	*717*	*22'*	*9:27*
6/20/2024	*P-98/P-101*	*C.O*	*717*	*23'*	
6/20/2024	*P-96/P-101*	*C.O*	*717*	*23'*	
6/20/2024	*P-95/P-101*	*C.O*	*717*	*23'*	
6/20/2024	*P-101/P-102*	*O.D*	*86*	*97'*	*9:30*
6/20/2024	*P-94/P-101*	*C.O*	*717*	*23'*	
6/20/2024	*P-94/P-102*	*C.O*	*717*	*23'*	*9:56*
6/20/2024	*P-102/P-103*	*C.O*	*717*	*100'*	*10:32*
6/20/2024	*P-94/P-103*	*C.O*	*717*	*22'*	*10:53*

New England Liner Systems, Inc. — *Panel Seaming Form*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM NUMBER*	*SEAMER INITIALS*	*MACHINE #*	*SEAM LENGTH*	*COMMENTS*
6/20/2024	*P-93/P-103*	*C.O*	*717*	*22'*	
6/20/2024	*P-92/P-103*	*C.O*	*717*	*23'*	
6/20/2024	*P-90/P-103*	*C.O*	*717*	*6'*	
6/20/2024	*P-84/P-103*	*C.O*	*717*	*24'*	
6/20/2024	*P-83/P-103*	*C.O*	*717*	*23'*	
6/20/2024	*P-103/P-104*	*O.D*	*86*	*215'*	*10:37*
6/20/2024	*P-104/P-105*	*O.D*	*86*	*26'*	*11:35*
6/20/2024	*P-104/P-106*	*O.D*	*86*	*182'*	
6/20/2024	*P-105/P-106*	*C.O*	*717*	*23'*	*11:33*
6/20/2024	*P-106/P-107*	*C.O*	*717*	*175'*	
6/20/2024	*P-105/P-107*	*C.O*	*717*	*30'*	*11:40*
6/20/2024	*P-107/P-108*	*O.D*	*86*	*194'*	
6/25/2024	*P-108/P-109*	*O.D*	*86*	*159'*	*9:16*
6/25/2024	*P-109/P-110*	*C.O*	*717*	*23'*	*9:04*
6/25/2024	*P-108/P-110*	*O.D*	*86*	*30'*	
6/25/2024	*P-109/P-111*	*C.O*	*717*	*161'*	*9:17*
6/25/2024	*P-110/P-111*	*C.O*	*717*	*22'*	
6/25/2024	*P-111/P-112*	*O.D*	*86*	*173'*	*9:42*
6/25/2024	*P-112/P-113*	*C.O*	*717*	*167'*	*9:39*
6/25/2024	*P-113/P-114*	*O.D*	*86*	*164'*	*10:19*
6/25/2024	*P-114/P-115*	*C.O*	*717*	*24'*	*10:30*
6/25/2024	*P-115/P-116*	*C.O*	*717*	*23'*	*10:26*
6/25/2024	*P-114/P-116*	*C.O*	*717*	*134'*	

New England Liner Systems, Inc. — *Panel Seaming Form*

PRODUCT: *40 Mill LLDPE*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

DATE	*SEAM NUMBER*	*SEAMER INITIALS*	*MACHINE #*	*SEAM LENGTH*	*COMMENTS*
6/25/2024	*P-115/P-117*	*O.D*	*86*	*26'*	*10:47*
6/25/2024	*P-116/P-117*	*O.D*	*86*	*129'*	
6/25/2024	*P-117/P-118*	*C.O*	*717*	*148'*	*12:30*
6/25/2024	*P-118/P-120*	*O.D*	*86*	*119'*	
6/25/2024	*P-118/P-120*	*O.D*	*86*	*20'*	*12:51*
6/25/2024	*P-119/P-120*	*C.O*	*717*	*23'*	*12:48*
6/25/2024	*P-120/P-121*	*C.O*	*717*	*21'*	*12:54*
6/25/2024	*P-119/P-121*	*C.O*	*717*	*97'*	
6/25/2024	*P-121/P-122*	*O.D*	*86*	*93'*	*1:14*
6/25/2024	*P-122/P-123*	*C.O*	*717*	*65'*	*1:11*
6/25/2024	*P-123/P-124*	*O.D*	*86*	*35'*	*1:29*
6/25/2024	*P-124/P-125*	*C.O*	*717*	*32'*	*1:39*
6/25/2024	*P-123/P-125*	*C.O*	*717*	*32'*	
6/25/2024	*P-122/P-125*	*C.O*	*717*	*32'*	
6/25/2024	*P-121/P-125*	*C.O*	*717*	*32'*	
6/25/2024	*P-119/P-125*	*C.O*	*717*	*32'*	
6/25/2024	*P-118/P-125*	*C.O*	*717*	*20'*	
6/26/2024	*P-125/P-126*	*C.O*	*717*	*201'*	*7:02*
6/26/2024	*P-126/P-127*	*O.D*	*86*	*208'*	*7:15*
6/26/2024	*P-126/P-128*	*O.D*	*86*	*5'*	
6/26/2024	*P-127/P-128*	*C.O*	*717*	*23'*	*8:08*
6/26/2024	*P-127/P-129*	*C.O*	*717*	*213'*	*7:45*
6/26/2024	*P-128/P-129*	*C.O*	*717*	*9'*	

New England Liner Systems, Inc. — *Panel Seaming Form*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM NUMBER*	*SEAMER INITIALS*	*MACHINE #*	*SEAM LENGTH*	*COMMENTS*
6/26/2024	*P-129/P-130*	*O.D*	*86*	*237'*	*8:05*
6/26/2024	*P-130/P-131*	*C.O*	*717*	*242'*	*8:57*
6/26/2024	*P-131/P-132*	*O.D*	*86*	*247'*	*9:22*
6/26/2024	*P-132/P-133*	*C.O*	*717*	*252'*	*12:57*
6/26/2024	*P-133/P-134*	*C.O*	*717*	*240'*	*1:30*
6/26/2024	*P-133/P-135*	*C.O*	*717*	*15'*	
6/26/2024	*P-134/P-135*	*C.O*	*717*	*23'*	*1:24*
6/27/2024	*P-134/P-136*	*O.D*	*86*	*236'*	*9:42*
6/27/2024	*P-135/P-136*	*O.D*	*86*	*20'*	
6/27/2024	*P-136/P-137*	*C.O*	*717*	*260'*	*9:54*
6/27/2024	*P-137/P-138*	*O.D*	*86*	*187'*	*10:22*
6/27/2024	*P-137/P-139*	*O.D*	*86*	*74'*	
6/27/2024	*P-138/P-139*	*C.O*	*717*	*23'*	*10:22*
6/27/2024	*P-138/P-140*	*C.O*	*717*	*184'*	*10:31*
6/27/2024	*P-139/P-140*	*C.O*	*717*	*79'*	
6/27/2024	*P-140/P-141*	*O.D*	*86*	*270'*	*11:04*
6/27/2024	*P-141/P-142*	*C.O*	*717*	*122'*	*11:08*
6/27/2024	*P-142/P-143*	*C.O*	*717*	*23'*	
6/27/2024	*P-141/P-143*	*C.O*	*717*	*154'*	*12:48*
6/27/2024	*P-142/P-144*	*O.D*	*86*	*120'*	*1:00*
6/27/2024	*P-143/P-144*	*O.D*	*86*	*160'*	
6/27/2024	*P-144/P-145*	*C.O*	*717*	*280'*	*1:36*
6/27/2024	*P-145/P-147*	*O.D*	*86*	*241'*	*2:02*

New England Liner Systems, Inc. — *Panel Seaming Form*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM NUMBER*	*SEAMER INITIALS*	*MACHINE #*	*SEAM LENGTH*	*COMMENTS*
6/27/2024	*P-145/P-146*	*O.D*	*86*	*31'*	
6/27/2024	*P-146/P-147*	*C.O*	*717*	*23'*	*2:00*
6/28/2024	*P-147/P-148*	*C.O*	*717*	*244'*	*8:14*
6/28/2024	*P-146/P-148*	*C.O*	*717*	*20'*	
6/28/2024	*P-148/P-149*	*O.D*	*86*	*236'*	*8:38*
6/28/2024	*P-148/P-150*	*O.D*	*86*	*15'*	
6/28/2024	*P-149/P-150*	*C.O*	*717*	*23'*	*9:00*
6/28/2024	*P-149/P-151*	*C.O*	*717*	*238'*	*8:53*
6/28/2024	*P-151/P-152*	*O.D*	*86*	*223'*	*9:15*
6/28/2024	*P-152/P-153*	*C.O*	*717*	*211'*	*9:34*
6/28/2024	*P-153/P-155*	*O.D*	*86*	*120'*	*9:56*
6/28/2024	*P-153/P-154*	*O.D*	*86*	*76'*	
6/28/2024	*P-154/P-155*	*C.O*	*717*	*23'*	*9:55*
6/28/2024	*P-155/P-156*	*C.O*	*717*	*120'*	*10:03*
6/28/2024	*P-154/P-156*	*C.O*	*717*	*63'*	
6/28/2024	*P-156/P-157*	*O.D*	*86*	*168'*	*10:26*
6/28/2024	*P-157/P-158*	*C.O*	*717*	*148'*	*10:26*
6/28/2024	*P-158/P-159*	*O.D*	*86*	*128'*	*10:50*
6/28/2024	*P-159/P-160*	*O.D*	*86*	*50'*	*11:06*
7/18/2024	*P-161/P-163*	*O.D*	*86*	*21'*	
7/18/2024	*P-162/P-163*	*O.D*	*86*	*21'*	
7/19/2024	*P-163/P-164*	*C.O*	*717*	*13'*	*1:17*
7/19/2024	*P-164/P-166*	*C.O*	*717*	*34'*	

New England Liner Systems, Inc. — *Panel Seaming Form*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM NUMBER*	*SEAMER INITIALS*	*MACHINE #*	*SEAM LENGTH*	*COMMENTS*
7/19/2024	*P-164/P-165*	*C.O*	*717*	*50'*	*1:21*
7/19/2024	*P-165/P-166*	*C.O*	*717*	*23'*	*1:08*
7/19/2024	*P-163/P-166*	*O.D*	*86*	*438'*	*1:09*
7/19/2024	*P-165/P-167*	*C.O*	*717*	*111'*	*1:35*
7/19/2024	*P-166/P-167*	*C.O*	*717*	*478'*	
7/22/2024	*P-167/P-168*	*C.O*	*717*	*599'*	*8:22*
7/22/2024	*P-168/P-169*	*O.D*	*86*	*601'*	*9:09*
7/22/2024	*P-169/P-170*	*C.O*	*717*	*613'*	*9:40*
7/22/2024	*P-170/P-171*	*O.D*	*86*	*622'*	*10:27*
7/22/2024	*P-171/P-172*	*C.O*	*717*	*633'*	*11:42*
7/22/2024	*P-172/P-173*	*O.D*	*86*	*576'*	*1:26*
7/22/2024	*P-173/P-174*	*C.O*	*717*	*579'*	*1:29*
7/25/2024	*P-172/P-173*	*C.O*	*717*	*165'*	*9:21*
7/25/2024	*P-173/P-181*	*C.O*	*717*	*23'*	*9:15*
7/25/2024	*P-173/P-174*	*O.D*	*86*	*151'*	*9:35*
7/25/2024	*P-174/P-182*	*C.O*	*717*	*23'*	*9:57*
7/25/2024	*P-173/P-182*	*O.D*	*86*	*21'*	*9:50*
7/25/2024	*P-181/P-182*	*O.D*	*86*	*42'*	
7/25/2024	*P-181/P-183*	*O.D*	*86*	*85'*	
7/25/2024	*P-182/P-183*	*C.O*	*717*	*23'*	*10:09*
7/25/2024	*P-174/P-184*	*C.O*	*717*	*721'*	*11:52*
7/25/2024	*P-174/P-185*	*C.O*	*717*	*28'*	
7/25/2024	*P-182/P-185*	*C.O*	*717*	*62'*	

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PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM NUMBER*	*SEAMER INITIALS*	*MACHINE #*	*SEAM LENGTH*	*COMMENTS*
7/25/2024	*P-183/P-185*	*C.O*	*717*	*80'*	
7/25/2024	*P-185/P-186*	*O.D*	*86*	*168'*	
7/25/2024	*P-184/P-185*	*C.O*	*717*	*23'*	*1:07*
7/25/2024	*P-184/P-186*	*O.D*	*86*	*326'*	*12:14*
7/25/2024	*P-184/P-187*	*O.D*	*86*	*412'*	*1:14*
7/25/2024	*P-187/P-188*	*C.O*	*717*	*314'*	*2:02*
7/25/2024	*P-186/P-187*	*C.O*	*717*	*23'*	*2:14*
7/25/2024	*P-165/P-175*	*C.O*	*#717*	*48'*	*7:46*
7/25/2024	*P-167/P-175*	*C.O*	*#717*	*23'*	*7:39*
7/25/2024	*P-168/P-175*	*O.D*	*#86*	*125'*	*7:45*
7/25/2024	*P-168/P-176*	*C.O*	*#717*	*18'*	*8:33*
7/25/2024	*P-176/P-177*	*C.O*	*#717*	*47'*	
7/25/2024	*P-168/P-177*	*C.O*	*#717*	*12'*	*8:38*
7/25/2024	*P-169/P-177*	*C.O*	*#717*	*23'*	*8:15*
7/25/2024	*P-168/P-169*	*C.O*	*#717*	*136'*	*7:55*
7/25/2024	*P-169/P-170*	*O.D*	*86*	*130'*	*8:06*
7/25/2024	*P-170/P-178*	*C.O*	*717*	*23'*	
7/25/2024	*P-169/P-178*	*O.D*	*86*	*8'*	
7/25/2024	*P-177/P-178*	*O.D*	*86*	*90'*	*8:19*
7/25/2024	*P-178/P-179*	*O.D*	*86*	*100'*	
7/25/2024	*P-170/P-179*	*O.D*	*86*	*11'*	
7/25/2024	*P-171/P-179*	*C.O*	*717*	*23'*	*8:55*
7/25/2024	*P-170/P-171*	*O.D*	*86*	*118'*	*8:35*

New England Liner Systems, Inc. — *Panel Seaming Form*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM NUMBER*	*SEAMER INITIALS*	*MACHINE #*	*SEAM LENGTH*	*COMMENTS*
7/25/2024	*P-171/P-172*	*O.D*	*86*	*108'*	*9:04*
7/25/2024	*P-172/P-180*	*C.O*	*717*	*23'*	*9:05*
7/25/2024	*P-171/P-180*	*O.D*	*86*	*12'*	
7/25/2024	*P-179/P-180*	*O.D*	*86*	*108'*	
7/25/2024	*P-180/P-181*	*C.O*	*717*	*116'*	
7/25/2024	*P-172/P-181*	*C.O*	*717*	*13'*	
7/29/2024	*P-187/P-189*	*C.O*	*717*	*115'*	*7:41*
7/29/2024	*P-186/P-189*	*C.O*	*717*	*492'*	
7/29/2024	*P-188/P-192*	*O.D*	*39*	*60'*	*8:11*
7/29/2024	*P-191/P-192*	*C.O*	*717*	*23'*	
7/29/2024	*P-188/P-191*	*O.D*	*39*	*271'*	
7/29/2024	*P-189/P-191*	*O.D*	*39*	*474'*	
7/29/2024	*P-189/P-190*	*O.D*	*39*	*130'*	
7/29/2024	*P-190/P-191*	*C.O*	*717*	*23'*	
7/29/2024	*P-192/P-194*	*C.O*	*717*	*74'*	*9:13*
7/29/2024	*P-191/P-194*	*C.O*	*717*	*200'*	
7/29/2024	*P-194/P-193*	*C.O*	*717*	*23'*	
7/29/2024	*P-191/P-193*	*C.O*	*717*	*545'*	
7/29/2024	*P-190/P-193*	*C.O*	*717*	*124'*	
7/29/2024	*P-193/P-195*	*O.D*	*39*	*464'*	*9:58*
7/29/2024	*P-195/P-196*	*O.D*	*39*	*415'*	*10:58*
7/29/2024	*P-196/P-197*	*C.O*	*717*	*67'*	
7/29/2024	*P-196/P-198*	*C.O*	*717*	*80'*	*10:58*

New England Liner Systems, Inc. *Panel Seaming Form*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM NUMBER*	*SEAMER INITIALS*	*MACHINE #*	*SEAM LENGTH*	*COMMENTS*
7/29/2024	*P-197/P-198*	*C.O*	*717*	*11'*	
7/30/2024	*P-194/P-200*	*O.D*	*39*	*222'*	*11:54*
7/30/2024	*P-194/P-199*	*O.D*	*39*	*61'*	
7/30/2024	*P-199/P-200*	*C.O*	*717*	*23'*	
7/30/2024	*P-193/P-199*	*O.D*	*39*	*201'*	
7/30/2024	*P-195/P-199*	*C.O*	*717*	*23'*	
7/30/2024	*P-196/P-201*	*C.O*	*717*	*23'*	
7/30/2024	*P-201/P-202*	*C.O*	*717*	*23'*	
7/30/2024	*P-200/P-202*	*C.O*	*717*	*226'*	*12:24*
7/30/2024	*P-199/P-202*	*C.O*	*717*	*263'*	
7/30/2024	*P-195/P-202*	*C.O*	*717*	*36'*	
7/30/2024	*P-202/P-203*	*O.D*	*39*	*528'*	*2:44*
9/17/24.	*P-1/P-204*	*C.O*	*717*	*174'*	*8:12*
9/17/24.	*P-204/P-205*	*F.R*	*39*	*205'*	*8:34*
9/17/24.	*P-205/P-206*	*F.R*	*39*	*209'*	*9:15*
9/17/24.	*P-206/P-207*	*F.R*	*39*	*27'*	
9/17/24.	*P-207/P-208*	*C.O*	*717*	*23'*	*10:06*
9/17/24.	*P-206/P-208*	*F.R*	*39*	*135'*	*9:48*
9/17/24.	*P-207/P-209*	*F.R*	*39*	*13'*	
9/17/24.	*P-208/P-209*	*F.R*	*39*	*96'*	*10:19*
9/17/24.	*P-209/P-210*	*F.R*	*39*	*45'*	*11:02*
9/17/24.	*P-210/P-211*	*F.R*	*39*	*54'*	*10:39*
9/17/24.	*P-209/P-211*	*F.R*	*39*	*45'*	

New England Liner Systems, Inc. — *Panel Seaming Form*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM NUMBER*	*SEAMER INITIALS*	*MACHINE #*	*SEAM LENGTH*	*COMMENTS*
9/17/24.	*P-208/P-211*	*F.R*	*39*	*45'*	
9/17/24.	*P-206/P-211*	*F.R*	*39*	*44'*	*11:23*
9/17/24.	*P-203/P-211*	*C.O*	*717*	*236'*	*8:57*
9/17/24.	*P-211/P-212*	*C.O*	*717*	*23'*	*8:45*
9/17/24.	*P-203/P-212*	*C.O*	*717*	*272'*	
9/17/24.	*P-211/P-214*	*C.O*	*717*	*92'*	*11:32*
9/17/24.	*P-213/P-214*	*C.O*	*717*	*23'*	*11:27*
9/17/24.	*P-211/P-213*	*C.O*	*717*	*337'*	*10:01*
9/17/24.	*P-212/P-213*	*C.O*	*717*	*252'*	
9/17/24.	*P-214/P-215*	*F.R*	*39*	*89'*	*11:44*
9/17/24.	*P-213/P-215*	*F.R*	*39*	*556'*	*12:52*
9/17/24.	*P-215/P-216*	*C.O*	*717*	*614'*	*12:48*
9/17/24.	*P-216/P-218*	*F.R*	*39*	*471'*	*2:03*
9/17/24.	*P-217/P-218*	*C.O*	*717*	*23'*	*1:44*
9/17/24.	*P-216/P-217*	*F.R*	*39*	*138'*	
9/17/24.	*P-217/P-219*	*C.O*	*717*	*113'*	
9/17/24.	*P-218/P-219*	*C.O*	*717*	*185'*	*1:55*
9/17/24.	*P-209/P-220*	*F.R*	*39*	*11'*	
9/17/24.	*P-210/P-220*	*F.R*	*39*	*11'*	
9/17/24.	*P-218/P-221*	*C.O*	*717*	*270'*	*4:53*
9/17/24.	*P-221/P-223*	*C.O*	*717*	*14'*	
9/17/24.	*P-221/P-222*	*C.O*	*717*	*245'*	
9/17/24.	*P-219/P-222*	*C.O*	*717*	*282'*	*2:51*

New England Liner Systems, Inc. — *Panel Seaming Form*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM NUMBER*	*SEAMER INITIALS*	*MACHINE #*	*SEAM LENGTH*	*COMMENTS*
9/17/24.	*P-222/P-223*	*C.O*	*717*	*10'*	
9/17/24.	*P-222/P-225*	*F.R*	*39*	*184*	*5:50*
9/17/24.	*P-224/P-225*	*C.O*	*717*	*23'*	*6:09*
10/8/2024	*P-226/P-228*	*P.O*	*123*	*20'*	
10/8/2024	*P-226/P-227*	*P.O*	*123*	*10'*	
10/8/2024	*P-227/P-228*	*P.O*	*123*	*30'*	
10/8/2024	*P-228/P-229*	*P.O*	*123*	*126'*	
10/8/2024	*P-229/P-230*	*C.M*	*239*	*131'*	
10/8/2024	*P-230/P-231*	*C.M*	*239*	*137'*	
10/8/2024	*P-231/P-232*	*P.O*	*123*	*135'*	
10/8/2024	*P-232/P-233*	*C.M*	*239*	*139'*	
10/8/2024	*P-233/P-235*	*P.O*	*123*	*101'*	
10/8/2024	*P-233/P-234*	*P.O*	*123*	*46'*	
10/8/2024	*P-235/P-236*	*C.M*	*239*	*101'*	
10/8/2024	*P-235/P-234*	*P.O*	*123*	*22'*	
10/8/2024	*P-234/P-236*	*C.M*	*239*	*46'*	
10/8/2024	*P-236/P-237*	*P.O*	*123*	*143'*	
10/8/2024	*P-237/P-238*	*C.M*	*239*	*130'*	
10/8/2024	*P-238/P-239*	*P.O*	*123*	*117'*	
10/8/2024	*P-239/P-240*	*C.M*	*239*	*90'*	
10/8/2024	*P-239/P-241*	*C.M*	*239*	*20'*	
10/8/2024	*P-240/P-241*	*C.M*	*239*	*22'*	
10/8/2024	*P-240/P-242*	*P.O*	*123*	*90'*	

New England Liner Systems, Inc. — *Panel Seaming Form*

PRODUCT: *40 Mill LLDPE*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

DATE	*SEAM NUMBER*	*SEAMER INITIALS*	*MACHINE #*	*SEAM LENGTH*	*COMMENTS*
10/8/2024	*P-241/P-242*	*P.O*	*123*	*6'*	
10/8/2024	*P-242/P-243*	*P.O*	*123*	*100'*	
10/8/2024	*P-243/P-244*	*P.O*	*123*	*89'*	
10/8/2024	*P-244/P-245*	*P.O*	*123*	*62'*	
10/8/2024	*P-245/P-246*	*P.O*	*123*	*52'*	
10/8/2024	*P-246/P-247*	*P.O*	*123*	*37'*	

New England Liner Systems, Inc. ***Repair Report***

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

Repair Date	Repair Number	Seam Number	Panel Numbers	Repair Crew	Machine Number	V-Box Test pass/fail	Location Comments
6/12/2024	R.1	P-3/P-4/P-5		C.O	616	PASS	91' to S/E
6/12/2024	R.2	P-4/P-6		C.O	616	PASS	92' to S/E BOOT
6/12/2024	R.3	P-4/P-5/P-6		C.O	616	PASS	99' to S/E
6/12/2024	R.4	P-5/P-6		C.O	616	PASS	124' to S/E
6/12/2024	R.5		P-6	C.O	616	PASS	124' to S/E /4' to S/W
6/12/2024	R.6	P-6/P-7		C.O	616	PASS	178' to S/E DT-1
6/12/2024	R.7	P-7/P-9		C.O	616	PASS	217' to S/E DT-2
6/12/2024	R.8	P-7/P-8/P-9		C.O	616	PASS	104' to S/E
6/12/2024	R.9	P-8/P-9		C.O	616	PASS	104' to S/E / 13' to S/W
6/12/2024	R.10	P-8/P-9/P-10		C.O	616	PASS	113' to S/E
6/12/2024	R.11	P-10/P-11		C.O	616	PASS	3' to S/E
6/12/2024	R.12	P-10/P-11		C.O	616	PASS	262' to S/E DT-3
6/12/2024	R.13	P-11/P-12/P-13		C.O	616	PASS	226' to S/E
6/12/2024	R.14	P-11/P-13		C.O	616	PASS	131' to S/E DT-4
6/12/2024	R.15	P-13/P-14		C.O	616	PASS	3' to S/E
6/12/2024	R.16	P-13/P-14		C.O	616	PASS	10' to S/E CAP
6/12/2024	R.17	P-13/P-14		C.O	616	PASS	142' to S/E
6/13/2024	R.18	P-12/P-13/P-14		C.O	616	PASS	226 to to S/E BOOT
6/13/2024	R.19	P-14/P-15/P-16		C.O	616	PASS	230' to S/E
6/13/2024	R.20	P-15/P-17		C.O	616	PASS	173' to S/E DT-5
6/13/2024	R.21	P-15/P-16/P-17		C.O	616	PASS	234' to S/E
6/13/2024	R.22	P-17/P-18		C.O	616	PASS	85' to S/E DT-6
6/13/2024	R.23		P-17	C.O	616	PASS	148' to S/E /7' to N/E
6/13/2024	R.24	P-17/P-18		C.O	616	PASS	263' to S/E
6/13/2024	R.25	P-18/P-19		C.O	616	PASS	96' to S/E / 8' to N/E BOOT
6/13/2024	R.26	P-18/P-19/P-20/P-21		C.O	616	PASS	115' to S/E CAP Crousin
6/13/2024	R.27	P-18/P-20		C.O	616	PASS	178' to S/E
6/13/2024	R.28	P-19/P-21		C.O	616	PASS	E.O.S
6/13/2024	R.29	P-18/P-20		O.D	616	PASS	120' to S/E DT-7
6/14/2024	R.30	P-19/P-21		O.D	613	PASS	14' to S/E DT-8

New England Liner Systems, Inc. ***Repair Report***

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

Repair Date	Repair Number	Seam Number	Panel Numbers	Repair Crew	Machine Number	V-Box Test pass/fail	Location Comments
6/14/2024	R.31	P-21/P-22		O.D	613	PASS	131' to S/E DT-9
6/14/2024	R.32	P-22/P-32/P-33		O.D	613	PASS	232' to S
6/14/2024	R.33	P-22/P-30/P-32		O.D	613	PASS	200' to S
6/14/2024	R.34	P-22/P-30		O.D	613	PASS	183' to S
6/14/2024	R.35	P-22/P-29/P-30		O.D	613	PASS	168' to S
6/14/2024	R.36	P-22/P-27/P-29		O.D	613	PASS	137' to S
6/14/2024	R.37	P-22/P-26/P-27		O.D	613	PASS	105' to S
6/14/2024	R.38	P-22/P-25/P-26		O.D	613	PASS	74' to S
6/14/2024	R.39	P-22/P-24/P-25		O.D	613	PASS	42' to S
6/14/2024	R.40	P-22/P-23/P-24		C.O	616	PASS	10' to S
6/14/2024	R.41	P-24/P-25		C.O	616	PASS	E.O.S
6/14/2024	R.42	P-26/P-27/P-28		C.O	616	PASS	44' to S/E
6/14/2024	R.43	P-27/P-28/P-29		C.O	616	PASS	50' to S/E
6/14/2024	R.44	P-29/P-30/P-31		C.O	616	PASS	38' to S/E
6/14/2024	R.45	P-30/P-31/P-32		C.O	616	PASS	43' to S/E
6/14/2024	R.46	P-30/P-32		C.O	616	PASS	58' to S/E DT-10
6/14/2024	R.47	P-32/P-33		C.O	616	PASS	51' to S/E DT-11
6/14/2024	R.48	P-33/P-34		C.O	616	PASS	108' to S/E BOOT
6/14/2024	R.49	P-35/P-36/P-37		C.O	616	PASS	83' to S/E
6/14/2024	R.50		P-37	C.O	616	PASS	94' to S/E /10' to N/E
6/14/2024	R.51		P-37	C.O	616	PASS	94' to S/E /1' to N/E
6/14/2024	R.52	P-36/P-37/P-38		C.O	616	PASS	86' to S/E
6/14/2024	R.53	P-36/P-38		C.O	616	PASS	45' to S/E DT-12
6/14/2024	R.54	P-38/P-39		O.D	613	PASS	194' to S/E DT-13
6/14/2024	R.55	P-39/P-40/P-41		O.D	613	PASS	143' to S/E
6/14/2024	R.56	P-40/P-42		O.D	613	PASS	94' to S/E
6/14/2024	R.57	P-40/P-41/P-42		O.D	613	PASS	142' to S/E
6/14/2024	R.58	P-42/P-43		O.D	613	PASS	30' to S/E DT-14
6/14/2024	R.59	P-42/P-44		O.D	613	PASS	132' to S/E BOOT
6/14/2024	R.60	P-43/P-44		O.D	613	PASS	158' to S/E DT-15

New England Liner Systems, Inc. ***Repair Report***

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

Repair Date	Repair Number	Seam Number	Panel Numbers	Repair Crew	Machine Number	V-Box Test pass/fail	Location Comments
6/14/2024	R.61	P-43/P-44/P-45		O.D	613	PASS	174' to S/E
6/14/2024	R.62	P-45/P-50/P-51		O.D	613	PASS	E.O.S
6/14/2024	R.63	P-44/P-45/P-50		O.D	613	PASS	163' to E
6/14/2024	R.64	P-44/P-47/P-49		O.D	613	PASS	102' to E
6/14/2024	R.65	P-44/P-46/P-47		O.D	613	PASS	41' to E
6/17/2024	R.66	P-44/P-46		C.O	613	PASS	E.O.S
6/17/2024	R.67	P-47/P-48/P-49		C.O	613	PASS	64' to N/E
6/17/2024	R.68	P-48/P-50		C.O	613	PASS	10' to N/E
6/17/2024	R.69	P-48/P-49/P-50		C.O	613	PASS	64' to N/E
6/17/2024	R.70	P-49/P-50		C.O	613	PASS	76' to N/E DT-16
6/17/2024	R.71	P-50/P-51		C.O	613	PASS	193' to E
6/17/2024	R.72	P-50/P-51		C.O	613	PASS	146' to E
6/17/2024	R.73	P-51/P-52/P-53		C.O	613	PASS	59' to E
6/17/2024	R.74	P-51/P-53		C.O	613	PASS	70' to E DT-17
6/17/2024	R.75	P-652/P-53		C.O	613	PASS	59' to E / 12' to S DT-18
6/17/2024	R.76	P-52/P-53/P-54		C.O	613	PASS	58' to E
6/17/2024	R.77	P-56/P-57		C.O	613	PASS	27' to E DT-19
6/17/2024	R.78	P-56/P-57		C.O	613	PASS	126' to E BOOT
6/17/2024	R.79		P-67	C.O	613	PASS	133' to E /5' to N
6/17/2024	R.80	P-69/P-70/P-71		C.O	613	PASS	103' to E
6/17/2024	R.81	P-59/P-60/P-61		C.O	613	PASS	164' to E
6/17/2024	R.82	P-59/P-60		C.O	613	PASS	94' to E DT-20
6/17/2024	R.83	P-60/P-61/P-62		C.O	613	PASS	167' to E
6/17/2024	R.84	P-63/P-64		C.O	613	PASS	102' to E DT-21
6/17/2024	R.85	P-64/P-65/P-66		C.O	613	PASS	136' to E
6/17/2024	R.86	P-64/P-65		C.O	613	PASS	12' to E DT-22
6/17/2024	R.87	P-65/P-67		C.O	613	PASS	103' to E DT-23
6/17/2024	R.88	P-65/P-66/P-67		C.O	613	PASS	137' to E
6/17/2024	R.89	P-68/P-69		C.O	613	PASS	8' to E DT-24
6/17/2024	R.90	P-70/P-71/P-72		C.O	613	PASS	103' to E

New England Liner Systems, Inc. ***Repair Report***

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

Repair Date	Repair Number	Seam Number	Panel Numbers	Repair Crew	Machine Number	V-Box Test pass/fail	Location Comments
6/17/2024	R.91	P-71/P-72		C.O	613	PASS	109' to E
6/17/2024	R.92	P-71/P-72		C.O	613	PASS	122' to E
6/17/2024	R.93	P-71/P-72		C.O	613	PASS	145' to E BOOT
6/17/2024	R.94	P-71/P-72		C.O	613	PASS	163' to E
6/17/2024	R.95	P-71/P-72		C.O	613	PASS	170' to E
6/18/2024	R.96	P-72/P-73		C.O	613	PASS	121' to E
6/18/2024	R.97	P-73/P-74		C.O	613	PASS	10' to E
6/18/2024	R.98	P-73/P-74		C.O	613	PASS	65' to E
6/18/2024	R.99	P-73/P-74		C.O	613	PASS	73' to E
6/18/2024	R.100	P-74/P-75		C.O	613	PASS	41' to E
6/18/2024	R.101	P-74/P-75/P-76		C.O	613	PASS	58' to E
6/18/2024	R.102	P-75/P-76		C.O	613	PASS	58' to E /13' to S
6/18/2024	R.103	P-75/P-76		C.O	613	PASS	183' to E DT-25
6/18/2024	R.104	P-75/P-76/P-77		C.O	613	PASS	60' to E
6/18/2024	R.105	P-76/P-77		C.O	613	PASS	78' to E
6/18/2024	R.106	P-76/P-77		C.O	613	PASS	157' to E DT-26
6/18/2024	R.107	P-78/P-80		C.O	613	PASS	10' to E
6/20/2024	R.108	P-78/P-79/P-80		C.O	613	PASS	31' to E
6/20/2024	R.109	P-78/P-79		C.O	613	PASS	153' to E BOOT
6/20/2024	R.110	P-79/P-80/P-81		C.O	613	PASS	32' to E
6/20/2024	R.111	P-79/P-81		C.O	613	PASS	110' to E
6/20/2024	R.112	P-79/P-81		C.O	613	PASS	127' to E DT-27
6/20/2024	R.113	P-81/P-82		C.O	613	PASS	133' to E DT-28
6/20/2024	R.114	P-84/P-85/P-86		C.O	613	PASS	15' to E
6/20/2024	R.115	P-84/P-86/P-87		C.O	613	PASS	58' to E
6/20/2024	R.116	P-84/P-87/P-88		C.O	613	PASS	102' to E
6/20/2024	R.117	P-84/P-88/P-89		C.O	613	PASS	150' to E
6/20/2024	R.118	P-84/P-89/P-90		C.O	613	PASS	200' to E
6/20/2024	R.119	P-88/P-89		C.O	613	PASS	E.O.S
6/20/2024	R.120	P-88/P-89		C.O	613	PASS	51' to N/E DT-29

New England Liner Systems, Inc. ***Repair Report***

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

Repair Date	Repair Number	Seam Number	Panel Numbers	Repair Crew	Machine Number	V-Box Test pass/fail	Location Comments
6/20/2024	R.121	P-89/P-91		O.D	616	PASS	E.O.S
6/20/2024	R.122	P-89/P-91		O.D	616	PASS	50' to N/E
6/20/2024	R.123	P-89/P-91		O.D	616	PASS	91' to N/E
6/20/2024	R.124	P-89/P-91		O.D	616	PASS	147' to N/E
6/20/2024	R.125	P-89/P-91		O.D	616	PASS	170' to N/E DT-30
6/20/2024	R.126	P-89/P-90/P-91		O.D	616	PASS	182' to N/E
6/20/2024	R.127	P-83/P-103		O.D	616	PASS	E.O.S
6/20/2024	R.128	P-83/P-84/P-103		O.D	616	PASS	238' to N/E
6/20/2024	R.129	P-84/P-90/P-103		O.D	616	PASS	250' to N/E /5' to N/W
6/20/2024	R.130	P-90/P-92/P-103		O.D	616	PASS	250' to N/E
6/20/2024	R.131	P-90/P-92		O.D	616	PASS	237' to N/E
6/20/2024	R.132	P-90/P-91/P-92		O.D	616	PASS	188' to N/E
6/20/2024	R.133	P-91/P-92		O.D	616	PASS	161' to N/E
6/20/2024	R.134	P-92/P-93		O.D	616	PASS	E.O.S
6/20/2024	R.135	P-92/P-93		O.D	616	PASS	10' to N/E
6/20/2024	R.136	P-92/P-93		O.D	616	PASS	183' to N/E
6/21/2024	R.137	P-92/P-93/P-103		F.R	613	PASS	145' to N/E
6/21/2024	R.138	P-93/P-94/P-103		F.R	613	PASS	122' to N/E
6/21/2024	R.139	P-94/P-95/P-101		F.R	613	PASS	203' to N/E
6/21/2024	R.140	P-95/P-96/P-101		F.R	613	PASS	196' to N/E
6/21/2024	R.141	P-96/P-97/P-98		F.R	613	PASS	28' to N/E BOOT
6/21/2024	R.142	P-96/P-98/P-101		F.R	613	PASS	121' to N/E
6/21/2024	R.143	P-98/P-100/P-101		F.R	613	PASS	60' to N/E
6/21/2024	R.144	P-98/P-100		F.R	613	PASS	27' to N/E / 5' to S/E BOOT
6/21/2024	R.145	P-98/P-99/P-100		F.R	613	PASS	29' to N/E
6/21/2024	R.146	P-98/P-99		F.R	616	PASS	E.O.S
6/21/2024	R.147	P-101/P-102		F.R	613	PASS	87' to N/W
6/21/2024	R.148	P-94/P-101/P-102		F.R	613	PASS	97' to N/E
6/21/2024	R.149	P-94/P-102/P-103		F.R	613	PASS	100' to N/W
6/21/2024	R.150	P-102/P-103		F.R	613	PASS	87' to N/W DT-33

New England Liner Systems, Inc. ***Repair Report***

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

Repair Date	Repair Number	Seam Number	Panel Numbers	Repair Crew	Machine Number	V-Box Test pass/fail	Location Comments
6/20/2024	R.151	P-102/P-103		O.D	613	PASS	58' to N/W
6/20/2024	R.152	P-102/P-103		O.D	613	PASS	41' to N/W
6/21/2024	R.153	P-103/P-104	P-104	F.R	613	PASS	5' to N/W / 2' to N/E BOOT
6/21/2024	R.154	P-103/P-104		F.R	613	PASS	65' to N/W
6/21/2024	R.155	P-103/P-104		F.R	613	PASS	101' to N/W
6/21/2024	R.156	P-103/P-104		F.R	613	PASS	109' to N/W DT-34
6/21/2024	R.157	P-103/P-104		F.R	613	PASS	115' to N/W
6/21/2024	R.158	P-103/P-104		F.R	613	PASS	129' to N/W
6/21/2024	R.159	P-103/P-104		F.R	613	PASS	E.O.S
6/21/2024	R.160	P-104/P-106		F.R	613	PASS	215' to N/W
6/21/2024	R.161	P-104/P-105/P-106		F.R	613	PASS	26' to N/W
6/21/2024	R.162	P-104/P-105		F.R	613	PASS	E.O.S
6/21/2024	R.163	P-105/P-107		F.R	613	PASS	10' to N/W DT-35
6/21/2024	R.164	P-105/P-106/P-107		F.R	613	PASS	30' to N/W
6/21/2024	R.165		P-106	F.R	613	PASS	37' to N/W / 1' to W
6/21/2024	R.166	P-103/P-104		F.R	613	PASS	77' to N/W
6/21/2024	R.167	P-106/P-107		F.R	613	PASS	200' to N/W
6/21/2024	R.168	P-107/P-108		F.R	613	PASS	E.O.S
6/21/2024	R.169	P-107/P-108		F.R	613	PASS	110' to N/W
6/21/2024	R.170	P-107/P-108		F.R	613	PASS	86' to N/W
6/21/2024	R.171	P-107/P-108		F.R	613	PASS	7' to N/W DT-36
6/21/2024	R.172	P-107/P-108		F.R	613	PASS	E.O.S
6/21/2024	R.173	P-105/P-107		F.R	613	PASS	E.O.S
6/21/2024	R.174	P-102/P-103		F.R	613	PASS	E.O.S
6/21/2024	R.175	P-101/P-102		F.R	613	PASS	E.O.S
6/21/2024	R.176	P-100/P-101		F.R	613	PASS	E.O.S
6/21/2024	R.177	P-99/P-100		F.R	613	PASS	E.O.S
6/21/2024	R.178	P-97/P-98		C.O	616	PASS	5' to N/W
6/21/2024	R.179	P-91/P-92		C.O	616	PASS	15' to N/E DT-31
6/21/2024	R.180		P-92	C.O	616	PASS	188' to N/E / 6' to S/E

New England Liner Systems, Inc. ***Repair Report***

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

Repair Date	Repair Number	Seam Number	Panel Numbers	Repair Crew	Machine Number	V-Box Test pass/fail	Location Comments
6/25/2024	R.181		P-1	C.O	616	PASS	
6/25/2024	R.182	P-1/P-2		C.O	616	PASS	
6/25/2024	R.183		P-2	C.O	616	PASS	
6/25/2024	R.184		P-5	C.O	616	PASS	
6/25/2024	R.185		P-18	C.O	616	PASS	146' to S/E
6/25/2024	R.186		P-108	C.O	616	PASS	31' to N/W / 3' to S/W
6/25/2024	R.187	P-108/P-109/P-110		C.O	616	PASS	159' to N/W
6/25/2024	R.188	P-109/P-110/P-111		C.O	616	PASS	161' to N/W
6/25/2024	R.189		P-109	C.O	616	PASS	5' to N/W BOOT
6/25/2024	R.190	P-111/P-112		C.O	616	PASS	E.O.S
6/25/2024	R.191	P-113/P-114		C.O	616	PASS	138' to N/W DT-37
6/26/2024	R.192	P-114/P-115		C.O	616	PASS	3' to N/W / 5' to S/W BOOT
6/26/2024	R.193	P-114/P-115/P-116		C.O	616	PASS	21' to N/W
6/26/2024	R.194	P-114/P-116		C.O	616	PASS	95' to N/W DT-38
6/26/2024	R.195	P-115/P-116/P-117		C.O	616	PASS	25' to N/W
6/26/2024	R.196	P-116/P-117		C.O	616	PASS	93' to N/W BOOT
6/26/2024	R.197	P-117/P-118		C.O	616	PASS	17' to N/W
6/26/2024	R.198	P-118/P-120		C.O	616	PASS	14' to N/W CAP
6/26/2024	R.199	P-118/P-119		C.O	616	PASS	89' to N/W
6/26/2024	R.200	P-118/P-119		F.R	613	PASS	110' to N/W
6/26/2024	R.201	P-118/P-119		F.R	613	PASS	120' to N/W
6/26/2024	R.202	P-118/P-119/P-125		F.R	613	PASS	139' to N/W
6/26/2024	R.203	P-120/P-121		F.R	613	PASS	E.O.S BOOT
6/26/2024	R.204	P-119/P-120/P-121		F.R	613	PASS	21' to N
6/26/2024	R.205	P-119/P-121/P-125		F.R	613	PASS	118' to N
6/26/2024	R.206	P-121/P-122/P-125		F.R	613	PASS	93' to N
6/26/2024	R.207	P-122/P-125		F.R	613	PASS	93' to N / 13' to E DT-40
6/26/2024	R.208	P-122/P-123/P-125		F.R	613	PASS	65' to N
6/26/2024	R.209	P-122/P-123		F.R	613	PASS	E.O.S
6/26/2024	R.210	P-123/P-124		F.R	613	PASS	13' to N DT-39

New England Liner Systems, Inc. ***Repair Report***

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

Repair Date	*Repair Number*	*Seam Number*	*Panel Numbers*	*Repair Crew*	*Machine Number*	*V-Box Test pass/fail*	*Location Comments*
6/26/2024	*R.211*	*P-123/P-124/P-125*		*F.R*	*613*	*PASS*	*35' to N*
6/26/2024	*R.212*	*P-124/P-125*		*F.R*	*613*	*PASS*	*E.O.S*
6/26/2024	*R.213*		*P-125*	*F.R*	*613*	*PASS*	*3' to N BOOT*
6/26/2024	*R.214*	*P-126/P-127/P-128*		*F.R*	*613*	*PASS*	*208' to W*
6/26/2024	*R.215*	*P-127/P-129*		*F.R*	*613*	*PASS*	*183' to W DT-41*
6/26/2024	*R.216*	*P-127/P-128/P-129*		*F.R*	*613*	*PASS*	*213' to W*
6/26/2024	*R.217*	*P-131/P-132*		*F.R*	*613*	*PASS*	*50' to W DT-42*
6/26/2024	*R.218*	*P-131/P-132*	*P-132*	*F.R*	*613*	*PASS*	*227' to W / 14' to N BOOT*
6/26/2024	*R.219*	*P-132/P-133*		*F.R*	*613*	*PASS*	*229' to W DT-43*
6/26/2024	*R.220*	*P-132/P-133*		*F.R*	*613*	*PASS*	*97' to W*
6/26/2024	*R.221*	*P-133/P-134/P-135*		*F.R*	*613*	*PASS*	*240' to W*
6/28/2024	*R.222*	*P-134/P-135/P-136*		*C.O*	*616*	*PASS*	*236' to W*
6/28/2024	*R.223*	*P-135/P-136*		*C.O*	*616*	*PASS*	*243' to W*
6/28/2024	*R.224*	*P-135/P-136*		*C.O*	*616*	*PASS*	*E.O.S*
6/28/2024	*R.225*	*P-136/P-137*		*C.O*	*616*	*PASS*	*190' to W DT-44*
6/28/2024	*R.226*	*P-137/P-138/P-139*		*C.O*	*616*	*PASS*	*187' to W*
6/28/2024	*R.227*	*P-137/P-138*		*C.O*	*616*	*PASS*	*105' to W*
6/28/2024	*R.228*	*P-137/P-138*		*C.O*	*616*	*PASS*	*50' to W DT-45*
6/28/2024	*R.229*	*P-137/P-138*		*C.O*	*616*	*PASS*	*E.O.S*
6/28/2024	*R.230*	*P-138/P-139/P-140*		*C.O*	*616*	*PASS*	*184' to W*
6/28/2024	*R.231*		*P-134*	*C.O*	*616*	*PASS*	*190' to W / 11' to N*
6/28/2024	*R.232*	*P-141/P-142*		*C.O*	*616*	*PASS*	*88' to W*
6/28/2024	*R.233*	*P-141/P-142/P-143*		*C.O*	*616*	*PASS*	*122' to W*
6/28/2024	*R.234*	*P-141/P-143*		*C.O*	*616*	*PASS*	*167' to W DT-46*
6/28/2024	*R.235*	*P-142/P-144*		*C.O*	*616*	*PASS*	*93' to W DT-47*
6/28/2024	*R.236*	*P-142/P-143/P-144*		*C.O*	*616*	*PASS*	*120' to W*
6/28/2024	*R.237*	*P-144/P-145*		*C.O*	*616*	*PASS*	*187' to W BOOT*
6/28/2024	*R.238*	*P-145/P-147*		*C.O*	*616*	*PASS*	*233' to W DT-48*
6/28/2024	*R.239*	*P-145/P-146/P-147*		*C.O*	*616*	*PASS*	*241' to W*
6/28/2024	*R.240*	*P-146/P-147*		*O.D*	*613*	*PASS*	*241' to W / 12' to N DT-49*

New England Liner Systems, Inc. **Repair Report**

PROJECT: Ledge Road Landfill
2024 Closure
Andover, MA

PRODUCT: 40 Mill LLDPE

Repair Date	Repair Number	Seam Number	Panel Numbers	Repair Crew	Machine Number	V-Box Test pass/fail	Location Comments
6/28/2024	R.241	P-146/P-147/P-148		O.D	613	PASS	244' to W
6/28/2024	R.242	P-148/P-149/P-150		O.D	613	PASS	236' to W
6/28/2024	R.243	P-149/P-151		O.D	613	PASS	213' to W DT-50
6/28/2024	R.244	P-153/P-155		O.D	613	PASS	30' to W DT-51
6/28/2024	R.245	P-153/P-154/P-155		O.D	613	PASS	120' to W
6/28/2024	R.246	P-154/P-155/P-156		O.D	613	PASS	120' to W
6/28/2024	R.247	P-157/P-158		C.O	616	PASS	58' to W DT-52
6/28/2024	R.248	P-158/P-159		C.O	616	PASS	95' to W / 12' to N BOOT
6/28/2024	R.249	P-159/P-160		O.D	613	PASS	32' to W DT-53
7/18/2024	R.250	P-33/P-34/P-161		C.O	616	PASS	E.O.S
7/18/2024	R.251	P-34/P-161/P-162/P-163		C.O	616	PASS	21' to S
7/18/2024	R.252	P-34/P-35/P-162		C.O	616	PASS	E.O.S
7/18/2024	R.253	P-35/P-37/P-163		C.O	616	PASS	E.O.S
7/18/2024	R.254			F.R	613		
7/18/2024	R.255			F.R	613		
7/18/2024	R.256			F.R	613		
7/18/2024	R.257			F.R	613		
7/18/2024	R.258			F.R	613		
7/18/2024	R.259			F.R	613		
7/18/2024	R.260			F.R	613		
7/18/2024	R.261	P-37/P-38/P-163		C.O	616	PASS	E.O.S
7/18/2024	R.262	P-38/P-39/P-163		C.O	616	PASS	E.O.S
7/18/2024	R.263	P-39/P-163		C.O	616	PASS	E.O.S / 8' to S
7/18/2024	R.264	P-39/P-163		C.O	616	PASS	E.O.S / 1' to N
7/18/2024	R.265	P-39/P-41/P-163		C.O	616	PASS	E.O.S
7/18/2024	R.266		P-41	C.O	616	PASS	E.O.S /P-39/P-41/ 5' to S
7/18/2024	R.267		P-41	C.O	616	PASS	E.O.S/P-39/P-41 /9' to S
7/18/2024	R.268		P-41	C.O	616	PASS	E.O.S/P-39/P-41 /13' to S
7/18/2024	R.269	P-41/P-42/P-163		C.O	616	PASS	E.O.S
7/18/2024	R.270	P-42/P-43/P-163		C.O	616	PASS	E.O.S

New England Liner Systems, Inc. ***Repair Report***

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

Repair Date	Repair Number	Seam Number	Panel Numbers	Repair Crew	Machine Number	V-Box Test pass/fail	Location Comments
7/18/2024	R.271	P-43/P-163		C.O	616	PASS	R.270 / 4' to S
7/18/2024	R.272	P-43/P-163		C.O	616	PASS	R.270 / 14' to S
7/18/2024	R.273	P-43/P-45/P-163		C.O	616	PASS	E.O.S
7/18/2024	R.274	P-45/P-50/P-51/P-163		C.O	616	PASS	E.O.S
7/18/2024	R.275	P-51/P-53/P-163		C.O	616	PASS	E.O.S
7/18/2024	R.276	P-53/P-54/P-163		C.O	616	PASS	E.O.S
7/18/2024	R.277	P-54/P-55/P-163		C.O	616	PASS	E.O.S
7/18/2024	R.278	P-55/P-56/P-163		C.O	616	PASS	E.O.S
7/18/2024	R.279			C.O	616	PASS	
7/18/2024	R.280			C.O	616	PASS	
7/18/2024	R.281			C.O	616	PASS	
7/18/2024	R.282			C.O	616	PASS	
7/18/2024	R.283			C.O	616	PASS	
7/18/2024	R.284	P-56/P-163		C.O	616	PASS	R.283 /10' to S
7/18/2024	R.285	P-56/P-57/P-163		C.O	616	PASS	E.O.S
7/18/2024	R.286	P-57/P-163		C.O	616	PASS	R.285 /8' to S
7/18/2024	R.287	P-57/P-58/P-163		C.O	616	PASS	E.O.S
7/18/2024	R.288		P-58	C.O	616	PASS	R.287 /10' to S
7/18/2024	R.289						
7/18/2024	R.290						
7/18/2024	R.291						
7/18/2024	R.292	P-23/P-161/P-163		C.O	616	PASS	E.O.S
7/18/2024	R.293	P-163P-58/P-59/		C.O	616	PASS	E.O.S
7/18/2024	R.294	P-59/P-163		C.O	616	PASS	R.293 /7' to S DT-54
7/22/2024	R.295	P-59/P-61/P-163		F.R	613	PASS	E.O.S
7/22/2024	R.296	P-61/P-163		F.R	613	PASS	R.295 / 13' to S
7/22/2024	R.297	P-61/P-62/P-163		F.R	613	PASS	E.O.S
7/22/2024	R.298	P-62/P-163/P-164		F.R	613	PASS	E.O.S
7/22/2024	R.299	P-62/P-63/P-164		F.R	613	PASS	E.O.S
7/22/2024	R.300	P-63/P-64/P-164		F.R	613	PASS	E.O.S

New England Liner Systems, Inc. ***Repair Report***

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

Repair Date	Repair Number	Seam Number	Panel Numbers	Repair Crew	Machine Number	V-Box Test pass/fail	Location Comments
7/22/2024	R.301		P-64	F.R	613	PASS	R.300 /12' to S
7/22/2024	R.302	P-64/P-164		F.R	613	PASS	R.303 / 7' to N
7/22/2024	R.303	P-64/P-66/P-164		F.R	613	PASS	E.O.S
7/22/2024	R.304	P-66/P-164		F.R	613	PASS	R.303 / 3' to S
7/22/2024	R.305	P-66/P-67/P-164		F.R	613	PASS	E.O.S
7/22/2024	R.306	P-67/P-68/P-164		F.R	613	PASS	E.O.S
7/22/2024	R.307	P-68/P-69/P-164		F.R	613	PASS	E.O.S
7/22/2024	R.308	P-69/P-71/P-164		F.R	613	PASS	E.O.S
7/22/2024	R.309	P-71/P-72/P-164		F.R	613	PASS	E.O.S
7/22/2024	R.310	P-164/P-165		F.R	613	PASS	485' to S DT-55
7/22/2024	R.311	P-164/P-165/P-166		F.R	613	PASS	472' to S
7/22/2024	R.312	P-163/P-164/P-166		F.R	613	PASS	438' to S
7/19/2024	R.313	P-163/P-166		C.O	616	PASS	48' to S DT-56
7/19/2024	R.314	P-21/P-22/P-166/P-167		C.O	616	PASS	E.O.S
7/19/2024	R.315	P-166/P-167		C.O	616	PASS	7' to S DT-57
7/19/2024	R.316	P-165/P-166/P-167		F.R	613	PASS	478' to S
7/19/2024	R.317	P-20/P-167/P-168		F.R	613	PASS	E.O.S
7/19/2024	R.318	P-1667/P-168		F.R	613	PASS	99' to S DT-58
7/19/2024	R.319	P-18/P-168/P-169		F.R	613	PASS	E.O.S
7/19/2024	R.320	P-168/P-169		F.R	613	PASS	101' to S DT-59
7/19/2024	R.321	P-168/P-169		F.R	613	PASS	191' to S
7/19/2024	R.322	P-17/P-169/P-170		F.R	613	PASS	E.O.S
7/19/2024	R.323	P-169/P-170		F.R	613	PASS	92' to S /12' to W BOOT
7/19/2024	R.324	P-169/P-170		F.R	613	PASS	212' to S DT-60
7/19/2024	R.325	P-169/P-170		F.R	613	PASS	574' to S BOOT
7/19/2024	R.326	P-170/P-171		F.R	613	PASS	223' to S DT-61
7/19/2024	R.327	P-16/P-170/P-171		F.R	613	PASS	E.O.S
7/19/2024	R.328		P-16	F.R	613	PASS	R.327 / 4' to N
7/19/2024	R.329	P-14/P-171/P-172		F.R	613	PASS	E.O.S
7/19/2024	R.330	P-171/P-172		F.R	613	PASS	345' to S DT-62

New England Liner Systems, Inc. ***Repair Report***

PROJECT: *Ledge Road Landfill*
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PRODUCT: *40 Mill LLDPE*

Repair Date	Repair Number	Seam Number	Panel Numbers	Repair Crew	Machine Number	V-Box Test pass/fail	Location Comments
7/19/2024	R.331	P-12/P-172/P-173		F.R	613	PASS	E.O.S
7/19/2024	R.332	P-172/P-173		F.R	613	PASS	13' to S DT-64
7/19/2024	R.333	P-172/P-173		F.R	613	PASS	320' to S / 10' to W BOOT
7/22/2024	R.334	P-172/P-173		F.R	613	PASS	525' to S DT-63
7/22/2024	R.335	P-173/P-174		F.R	613	PASS	551' to S DT-65
7/22/2024	R.336	P-173/P-174		F.R	613	PASS	13' to S DT-66
7/22/2024	R.337	P-10/P-173/P-174		F.R	613	PASS	E.O.S
7/25/2024	R.338	Existing/P-165/P-175		F.R	613	PASS	E.O.S
7/25/2024	R.339	P-74/P-76/P-175		F.R	613	PASS	E.O.S
7/25/2024	R.340	P-76/P-77/P-175		F.R	613	PASS	E.O.S
7/25/2024	R.341	P-77/P-168/P-175		F.R	613	PASS	E.O.S
7/25/2024	R.342	P-77/P-78/P-168		F.R	613	PASS	R.343 / 6' to N
7/25/2024	R.343	P-78/P-168/P-176		F.R	613	PASS	E.O.S
7/25/2024	R.344	P-78/P-79/P-176		F.R	613	PASS	E.O.S
7/25/2024	R.345	P-79/P-81/P-176		F.R	613	PASS	E.O.S
7/25/2024	R.346	P-81/P-176/P-177		F.R	613	PASS	E.O.S
7/25/2024	R.347	P-81/P-82/P-177		C.O	616	PASS	E.O.S
7/25/2024	R.348	Existing/P-177/P-178		C.O	616	PASS	E.O.S
7/25/2024	R.349	P-165/P-167/P-175		F.R	613	PASS	48' to N
7/25/2024	R.350	P-167/P-168/P-175		F.R	613	PASS	125' to N
7/26/2024	R.351	P-168/P-169		C.O	616	PASS	194' to N
7/26/2024	R.352	P-168/P-169/P-177		C.O	616	PASS	59' to N
7/26/2024	R.353	P-168/P-176/P-177		C.O	616	PASS	47' to N
7/26/2024	R.354	P-169/P-177/P-178		C.O	616	PASS	94' to N
7/26/2024	R.355	P-169/P-170/P-178		C.O	#616	PASS	102' to N
7/26/2024	R.356	P-103/P-178		C.O	#616	PASS	E.O.S
7/26/2024	R.357	P-103/P-104/P-178		C.O	#616	PASS	E.O.S
7/26/2024	R.358	P-169/P-170		C.O	#616	PASS	230' to N
7/26/2024	R.359	P-170/P-171		C.O	#616	PASS	228' to N
7/26/2024	R.360	P-170/P-171/P-172		C.O	#616	PASS	111' to N

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Repair Date	*Repair Number*	*Seam Number*	*Panel Numbers*	*Repair Crew*	*Machine Number*	*V-Box Test pass/fail*	*Location Comments*
7/26/2024	*R.361*	*P-170/P-178/P-179*		*C.O*	*#616*	*PASS*	*100' to N*
7/26/2024	*R.362*	*P-178/P-179*		*C.O*	*#616*	*PASS*	*80' to N DT-67*
7/26/2024	*R.363*	*P-104/P-178/P-179*		*C.O*	*#616*	*PASS*	*E.O.S*
7/26/2024	*R.364*	*P-104/P-106/P-179*		*C.O*	*#616*	*PASS*	*E.O.S*
7/26/2024	*R.365*	*P-106/P-179/P-180*		*C.O*	*#616*	*PASS*	*E.O.S*
7/26/2024	*R.366*	*P-171/P-179/P-180*		*C.O*	*#616*	*PASS*	*108 ' to N*
7/26/2024	*R.367*	*P-171/P-172/P-180*		*C.O*	*#616*	*PASS*	*120' to N*
7/26/2024	*R.368*	*P-171/P-172*		*C.O*	*#616*	*PASS*	*228' to N*
7/26/2024	*R.369*	*P-172/P-173*		*C.O*	*#616*	*PASS*	*144' to N DT-68*
7/26/2024	*R.370*	*P-172/P-173/P-181*		*C.O*	*#616*	*PASS*	*129' to N*
7/26/2024	*R.371*	*P-172/P-180/P-181*		*C.O*	*#616*	*PASS*	*116' to N*
7/26/2024	*R.372*	*P-106/P-107/P-180*		*C.O*	*#616*	*PASS*	*E.O.S*
7/26/2024	*R.373*	*P-107/P-180/P-181*		*C.O*	*#616*	*PASS*	*E.O.S*
7/26/2024	*R.374*	*P-107/P-108/P-181*		*C.O*	*#616*	*PASS*	*E.O.S*
7/26/2024	*R.375*	*P-108/P-181/P-183*		*C.O*	*#616*	*PASS*	*E.O.S*
7/26/2024	*R.376*	*P-181/P-182/P-183*		*C.O*	*#616*	*PASS*	*85' to N*
7/26/2024	*R.377*	*P-181/P-182*		*C.O*	*#616*	*PASS*	*107' to N BOOT*
7/26/2024	*R.378*	*P-181/P-182*		*C.O*	*#616*	*PASS*	*113' to N DT-69*
7/26/2024	*R.379*	*P-173/P-181/P-182*		*C.O*	*#616*	*PASS*	*128' to N*
7/26/2024	*R.380*	*P-173/P-174/P-182*		*C.O*	*#616*	*PASS*	*148' to N*
7/26/2024	*R.381*	*P-172/P-173*		*C.O*	*#616*	*PASS*	*295' to N*
7/26/2024	*R.382*	*P-173/P-174*		*C.O*	*#616*	*PASS*	*300' to N*
7/26/2024	*R.383*	*Existing/P-183/P-185*		*C.O*	*#616*	*PASS*	*E.O.S*
7/26/2024	*R.384*	*P-182/P-183/P-185*		*C.O*	*#616*	*PASS*	*80' to N*
7/26/2024	*R.385*	*P-182/P-185*		*C.O*	*#616*	*PASS*	*106' to N DT-71*
7/26/2024	*R.386*	*P-174/P-182/P-185*		*C.O*	*#616*	*PASS*	*142' to N*
7/26/2024	*R.387*	*P-174/P-184/P-185*		*C.O*	*#616*	*PASS*	*721' to S*
7/26/2024	*R.388*	*P-174/P-184*		*C.O*	*#616*	*PASS*	*544' to S*
7/26/2024	*R.389*	*P-174/P-184*		*C.O*	*#616*	*PASS*	*285' to S DT-70*
7/26/2024	*R.390*	*P-9/P-174/P-184*		*C.O*	*#616*	*PASS*	*E.O.S*

New England Liner Systems, Inc. ***Repair Report***

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

Repair Date	*Repair Number*	*Seam Number*	*Panel Numbers*	*Repair Crew*	*Machine Number*	*V-Box Test pass/fail*	*Location Comments*
7/26/2024	*R.391*	*P-9/P-184*		*C.O*	*#616*	*PASS*	*R.390 / 1' to E*
7/26/2024	*R.392*	*Existing/P-184/P-187*		*C.O*	*#616*	*PASS*	*E.O.S*
7/26/2024	*R.393*	*P-184/P-187*		*C.O*	*#616*	*PASS*	*108' to S*
7/26/2024	*R.394*	*P-184/P-187*		*C.O*	*#616*	*PASS*	*384' to S DT-72*
7/26/2024	*R.395*	*P-184/P-186/P-187*		*C.O*	*#616*	*PASS*	*411' to S*
7/26/2024	*R.396*	*P-186/P-187*		*C.O*	*#616*	*PASS*	*411' to S /4' to E DT-74*
7/26/2024	*R.397*	*P-184/P-185/P-186*		*C.O*	*#616*	*PASS*	*168' to N*
7/26/2024	*R.398*	*P-185/P-186*		*C.O*	*#616*	*PASS*	*15' to N DT-73*
7/26/2024	*R.399*	*P-111/P-185/P-186*		*C.O*	*#616*	*PASS*	*E.O.S*
7/26/2024	*R.400*	*P-6/P-187/P-188*		*C.O*	*#616*	*PASS*	*E.O.S*
7/26/2024	*R.401*		*P-5*	*C.O*	*#616*	*PASS*	*R.400 / 16 to E*
7/26/2024	*R.402*	*P-79/P-176*		*C.O*	*#616*	*PASS*	*R.345 / 1' to N DT-75*
7/26/2024	*R.403*	*P-7/P-187*		*C.O*	*#616*	*PASS*	*R.392 / 7' to E DT-76*
7/26/2024	*R.404*	*P-108/P-110/P-183*		*C.O*	*#616*	*PASS*	*E.O.S*
7/26/2024	*R.405*	*P-110/P-111/P-185*		*C.O*	*#616*	*PASS*	*E.O.S*
7/26/2024	*R.406*	*P-111/P-112/P-186*		*C.O*	*#616*	*PASS*	*E.O.S*
7/30/2024	*R.407*	*P-187/P-188/P-189*		*F.R*	*#613*	*PASS*	*314' to S*
7/30/2024	*R.408*	*P-187/P-189*		*F.R*	*#613*	*PASS*	*402' to S / 3' to E BOOT*
7/30/2024	*R.409*	*P-186/P-187/P-188*		*F.R*	*#613*	*PASS*	*429' to S*
7/30/2024	*R.410*	*P-186/P-189*		*F.R*	*#613*	*PASS*	*107' to N DT-77*
7/30/2024	*R.411*	*P-12/P-186/P-189*		*C.O*	*#616*	*PASS*	*E.O.S*
7/30/2024	*R.412*	*P-12/P-13/P-189/P-190*		*C.O*	*#616*	*PASS*	*E.O.S*
7/30/2024	*R.413*	*P-189/P-190/P-191*		*F.R*	*#613*	*PASS*	*130' to N*
7/30/2024	*R.414*	*P-189/P-191*		*F.R*	*#613*	*PASS*	*437' to N DT-78*
7/30/2024	*R.415*	*P-188/P-189/P-191*		*F.R*	*#613*	*PASS*	*331' to S*
7/30/2024	*R.416*	*P-188/P-191*		*F.R*	*#613*	*PASS*	*70' to S*
7/30/2024	*R.417*	*P-188/P-191/P-192*		*F.R*	*#613*	*PASS*	*60' to S*
7/30/2024	*R.418*	*Existing/P-5/P-188/P-192*		*F.R*	*#613*	*PASS*	*E.O.S*
7/30/2024	*R.419*	*Existing/P-192*		*F.R*	*#613*	*PASS*	*E.O.S*
7/30/2024	*R.420*	*Existing/P-192/P-194*		*F.R*	*#613*	*PASS*	*E.O.S*

New England Liner Systems, Inc. ***Repair Report***

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

Repair Date	Repair Number	Seam Number	Panel Numbers	Repair Crew	Machine Number	V-Box Test pass/fail	Location Comments
7/30/2024	R.421	P-2/P-194		F.R	#613	PASS	E.O.S
7/30/2024	R.422	P-2/P-194		F.R	#613	PASS	E.O.S
7/30/2024	R.423	P-2/P-194		F.R	#613	PASS	E.O.S
7/30/2024	R.424	P-191/P-192/P-194		F.R	#613	PASS	74' to S
7/30/2024	R.425	P-191/P-194/P-195		F.R	#613	PASS	274' to S
7/30/2024	R.426	P-191/P-193		F.R	#613	PASS	294' to S DT-79
7/30/2024	R.427	P-191/P-193		F.R	#613	PASS	141' to N DT-80
7/30/2024	R.428	P-190/P-191/P-193		F.R	#613	PASS	124' to N
7/30/2024	R.429	P-113/P-114/P-190/P-193		C.O	#616	PASS	E.O.S
7/30/2024	R.430	P-114/P-116/P-193/P-195		C.O	#616	PASS	E.O.S
7/30/2024	R.431	P-193/P-195		F.R	#613	PASS	387' to N DT-81
7/30/2024	R.432	P-193/P-195		F.R	#613	PASS	396' to N / 7' to E BOOT
7/30/2024	R.433	P-116/P-195/P-196		C.O	#616	PASS	E.O.S
7/30/2024	R.434	P-195/P-196		F.R	#613	PASS	6' to N DT-83
7/30/2024	R.435	P-195/P-196		F.R	#613	PASS	200' to N
7/30/2024	R.436	P-195/P-196		F.R	#613	PASS	405' to N DT-82
7/30/2024	R.437	Existing/P-196/P-197		C.O	#616	PASS	E.O.S
7/30/2024	R.438						
7/30/2024	R.439	P-196/P-197/P-198		C.O	#616	PASS	60' to N
7/30/2024	R.440	P-197/P-198		C.O	#616	PASS	60' to N / 3' to E DT-84
7/30/2024	R.441	Existing/P-197/P-198		C.O	#616	PASS	60' to N / 11' to E
7/30/2024	R.442	Existing/P-196/P-198		F.R	#613	PASS	147' to N
7/30/2024	R.443	Exinting/Existing/P-196		F.R	#613	PASS	E.O.S
7/30/2024	R.444	Existing/Existing/P-196		F.R	#613	PASS	E.O.S
7/30/2024	R.445	Existing/Existing/P-196		F.R	#613	PASS	E.O.S
7/30/2024	R.446	Existing/Existing/P-196		F.R	#613	PASS	E.O.S
7/30/2024	R.447	Existing/Existing/P-196		F.R	#613	PASS	E.O.S
7/30/2024	R.448	Existing/Existing/P-196		F.R	#613	PASS	E.O.S
7/30/2024	R.449	Existing/Existing/P-196		F.R	#613	PASS	E.O.S
7/30/2024	R.450	Existing/Existing/P-196		F.R	#613	PASS	E.O.S

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PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

Repair Date	Repair Number	Seam Number	Panel Numbers	Repair Crew	Machine Number	V-Box Test pass/fail	Location Comments
7/30/2024	R.451	Existing/Existing/P-196		F.R	#613	PASS	E.O.S
7/30/2024	R.452	Existing/Existing/P-196		F.R	#613	PASS	E.O.S
7/30/2024	R.453	P-114/P-193		F.R	#613	PASS	R.429 / 5' to E DT-88
7/30/2024	R.454		P-198	F.R	#613	PASS	93' to N / 6' to E
7/30/2024	R.455	Existing/P-196/R.456		C.O	#616	PASS	E.O.S
7/30/2024	R.456	Existing/P-196/P-201/P-203		C.O	#616	PASS	E.O.S
7/30/2024	R.457	P-201/P-202/P-203/R.456		C.O	#616	PASS	526' to S
7/30/2024	R.458	Existing/P-203/R.456		C.O	#616	PASS	E.O.S
7/30/2024	R.459	Existing/P-203		C.O	#616	PASS	R.457 / 10' to E DT-89
7/30/2024	R.460	P-195/P-196/P-201/P-202		C.O	#616	PASS	525' to S
7/30/2024	R.461	P-194/P-199/P-200		C.O	#616	PASS	222' to S
7/30/2024	R.462	P-194/P-199		C.O	#616	PASS	252' to S BOOT
7/30/2024	R.463	P-193/P-194/P-199		C.O	#616	PASS	283' to S
7/30/2024	R.464	P-193/P-199		C.O	#616	PASS	464' to S DT-85
7/30/2024	R.465	P-193/P-195/P-199		C.O	#616	PASS	484' to S
7/30/2024	R.466	P-200/P-202		C.O	#616	PASS	73' to S / 7' to W BOOT
7/30/2024	R.467	P-199/P-200/P-202		C.O	#616	PASS	226' to S
7/30/2024	R.468	P-199/P-202		C.O	#616	PASS	405' to S DT-86
7/30/2024	R.469	P-195/P-199/P-202		C.O	#616	PASS	489' to S
7/30/2024	R.470	P-202/P-203		C.O	#616	PASS	305' to S
7/30/2024	R.471	P-202/P-203		C.O	#616	PASS	403' to S
7/30/2024	R.472	P-202/P-203		C.O	#616	PASS	496' to S DT-87
8/21/24.	R.473			F.R	#613	PASS	
8/21/24.	R.474			F.R	#613	PASS	
8/22/24.	R.475			C.O	#616	PASS	
9/17/2024	R.476	P-194/P-200/P-1		P.O	#616	PASS	E.O.S
9/17/2024	R.477	P-1/P-204/P-200		P.O	#616	PASS	194' to S/E
9/17/2024	R.478	P-1/P-204		P.O	#616	PASS	173' to S/E
9/17/2024	R.479		P-1	P.O	#616	PASS	170' to S/E / 9' to S/W
9/17/2024	R.480		P-1	P.O	#616	PASS	169' to S/E / 4' to S/W

New England Liner Systems, Inc. ***Repair Report***

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Repair Date	Repair Number	Seam Number	Panel Numbers	Repair Crew	Machine Number	V-Box Test pass/fail	Location Comments
9/17/2024	R.481		P-1	P.O	#616	PASS	160' to S/E / 1 to S/W
9/17/2024	R.482		P-1	P.O	#616	PASS	155' to S/E / 3' to S/W
9/17/2024	R.483	P-1/P-204		P.O	#616	PASS	E.O.S
9/17/2024	R.484	P-200/P-202/P-204		P.O	#616	PASS	200' to S/E / 8' to N/E
9/17/2024	R.485	P-202/P-204/P-205		P.O	#616	PASS	E.O.S
9/17/2024	R.486	P-202/P-203/P-205		P.O	#616	PASS	E.O.S
9/17/2024	R.487	P-205/P-206		P.O	#616	PASS	155' to S/E
9/17/2024	R.488	P-203/P-205/P-206/P-211		P.O	#616	PASS	E.O.S
9/17/2024	R.489	P-206/P-207/P-208		P.O	#616	PASS	27' to S/E
9/17/2024	R.490	P-206/P-208		P.O	#616	PASS	81' to S/E DT-90
9/17/2024	R.491	P-206/P-208/P-211		P.O	#616	PASS	E.O.S
9/17/2024	R.492	P-207/P-208/P-209		P.O	#616	PASS	13' to S/E
9/17/2024	R.493	P-208/P-209/P-211		P.O	#616	PASS	96' to S/E
9/17/2024	R.494	P-209/P-220		P.O	#616	PASS	E.O.S
9/17/2024	R.495	P-210/P-220		P.O	#616	PASS	E.O.S
9/17/2024	R.496	P-209/P-210/P-220		P.O	#616	PASS	11' to S/E
9/17/2024	R.497	P-209/P-210/P-211		P.O	#616	PASS	45' to S/E
9/17/2024	R.498		P-214	P.O	#616	PASS	5' to S / 5' to E BOOT
9/17/2024	R.499	P-211/P-214		P.O	#616	PASS	73' to S / 13' to E BOOT
9/17/2024	R.500	P-211/P-213/P-214		P.O	#616	PASS	91' to S
9/17/2024	R.501	P-213/P-214		P.O	#616	PASS	91' to S / 9' to E
9/17/2024	R.502	P-211/P-213		P.O	#616	PASS	233' to S DT-92
9/17/2024	R.503	P-211/P-213		P.O	#616	PASS	258' to S
9/17/2024	R.504	P-211/P-212/P-213		P.O	#616	PASS	428' to S
9/17/2024	R.505	P-150/P-212/P-213		E.G	#613	PASS	E.O.S
9/17/2024	R.506	P-150/P-212		E.G	#613	PASS	E.O.S
9/17/2024	R.507	P-148/P-212		E.G	#613	PASS	E.O.S
9/17/2024	R.508	P-148/P-212/P-203		E.G	#613	PASS	E.O.S
9/17/2024	R.509		P-203	E.G	#613	PASS	R.508' + 6'
9/17/2024	R.510		P-203	E.G	#613	PASS	26' to N / 3' to W

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9/17/2024	R.511	P-203/P-212		E.G	#613	PASS	43' to N
9/17/2024	R.512	P-203/P-212		E.G	#613	PASS	65' to N
9/17/2024	R.513	P-203/P-212		E.G	#613	PASS	224' to N
9/17/2024	R.514	P-203/P-212		E.G	#613	PASS	461' to S DT-91
9/17/2024	R.515	P-203/P-211/P-212		E.G	#613	PASS	424' to S
9/17/2024	R.516	P-203/P-211/P-212		E.G	#613	PASS	362' to S CAP
9/17/2024	R.517	P-203/P-211		E.G	#613	PASS	349' to S
9/17/2024	R.518	P-203/P-211		E.G	#613	PASS	339' to S
9/17/2024	R.519	P-203/P-211		E.G	#613	PASS	321' to S
9/17/2024	R.520	P-203/P-211		E.G	#613	PASS	277' to S
9/17/2024	R.521	P-203/P-211		E.G	#613	PASS	268' to S
9/17/2024	R.522	P-203/P-211		E.G	#613	PASS	195' to S
9/17/2024	R.523	P-214/P-215		P.O	#616	PASS	71' to S DT-93
9/17/2024	R.524	P-213/P-214/P-215		P.O	#616	PASS	89' to S
9/17/2024	R.525	P-213/P-215		P.O	#616	PASS	140' to S
9/17/2024	R.526	P-213/P-215		P.O	#616	PASS	439' to S
9/17/2024	R.527	P-213/P-215		P.O	#616	PASS	65' to N DT-94
9/17/2024	R.528	P-151/P-213/P-215		E.G	#613	PASS	E.O.S
9/17/2024	R.529	P-152/P-153/P-215/P-216		E.G	#613	PASS	E.O.S
9/17/2024	R.530	P-215/P-216		P.O	#616	PASS	44' to N DT-96
9/17/2024	R.531	P-215/P-216		P.O	#616	PASS	70' to S DT-95
9/17/2024	R.532	P-216/P-218		P.O	#616	PASS	E.O.S
9/17/2024	R.533	P-216/P-218		P.O	#616	PASS	34' to S
9/17/2024	R.534	P-216/P-218		P.O	#616	PASS	157' to S
9/17/2024	R.535	P-216/P-218		P.O	#616	PASS	236' to S
9/17/2024	R.536	P-216/P-218		P.O	#616	PASS	321' to S
9/17/2024	R.537	P-216/P-218		P.O	#616	PASS	437' to S DT-97
9/17/2024	R.538	P-216/P-217/P-218		P.O	#616	PASS	471' to S
9/17/2024	R.539	P-154/P-216/P-217		P.O	#616	PASS	E.O.S
9/17/2024	R.540	P-156/P-217/P-219		P.O	#616	PASS	E.O.S

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Repair Date	*Repair Number*	*Seam Number*	*Panel Numbers*	*Repair Crew*	*Machine Number*	*V-Box Test pass/fail*	*Location Comments*
9/17/2024	*R.541*	*P-217/P-218/P-219*		*P.O*	*#616*	*PASS*	*113' to N*
9/17/2024	*R.542*	*P-218/P-219/P-221*		*P.O*	*#616*	*PASS*	*298' to N*
9/17/2024	*R.543*	*P-219/P-221*		*P.O*	*#616*	*PASS*	*298' to N / 7' to E*
9/17/2024	*R.544*	*P-218/P-221*		*P.O*	*#616*	*PASS*	*339' to N*
9/17/2024	*R.545*		*P-221*	*P.O*	*#616*	*PASS*	*339' to N / 9' to E BOOT*
9/17/2024	*R.546*		*P-221*	*E.G*	*#613*	*PASS*	*2' to S BOOT*
9/17/2024	*R.547*	*P-221/P-222/P-223*		*E.G*	*#613*	*PASS*	*14' to S*
9/17/2024	*R.548*	*P-218/P-221*		*E.G*	*#613*	*PASS*	*26' to S DT-99*
9/17/2024	*R.549*	*P-219/P-221/P-222*		*E.G*	*#613*	*PASS*	*296' to S*
9/17/2024	*R.550*	*P-219/P-222*		*P.O*	*#616*	*PASS*	*165' to N BOOT*
9/17/2024	*R.551*	*P-219/P-222*		*P.O*	*#616*	*PASS*	*135' to N DT-98*
9/17/2024	*R.552*	*P-157/P-219/P-222*		*P.O*	*#616*	*PASS*	*E.O.S*
9/17/2024	*R.553*	*P-157/P-158/P-222*		*P.O*	*#616*	*PASS*	*E.O.S*
9/17/2024	*R.554*	*P-158/P-222/P-224*		*P.O*	*#616*	*PASS*	*E.O.S*
9/17/2024	*R.555*	*P-222/P-224/P-225*		*P.O*	*#616*	*PASS*	*309' to N*
9/17/2024	*R.556*	*P-222/P-225*		*P.O*	*#616*	*PASS*	*325' to N DT-100*
9/17/2024	*R.557*	*P-224/P-225*		*P.O*	*#616*	*PASS*	*325' to N / 10' to E DT-101*
10/8/2024	*R.558*	*226/227/228*		*E.G*	*#695*	*PASS*	*CROSS SEAM*
10/8/2024	*R.559*	*160/159/228/224*		*E.G*	*#695*	*PASS*	*TIE IN*
10/8/2024	*R.560*	*226/228/159*		*E.G*	*#695*	*PASS*	*TIE IN*
10/8/2024	*R.561*	*226/227/159*		*E.G*	*#695*	*PASS*	*TIE IN*
10/8/2024	*R.562*	*228/229/224*		*E.G*	*#695*	*PASS*	*TIE IN*
10/8/2024	*R.563*	*229/230/224*		*E.G*	*#695*	*PASS*	*TIE IN*
10/8/2024	*R.564*	*230/231/224*		*E.G*	*#695*	*PASS*	*TIE IN*
10/8/2024	*R.565*	*231/232/224*		*E.G*	*#695*	*PASS*	*TIE IN*
10/8/2024	*R.566*	*232/233/224*		*E.G*	*#695*	*PASS*	*TIE IN*
10/8/2024	*R.567*	*233/235/224*		*E.G*	*#695*	*PASS*	*TIE IN*
10/8/2024	*R.568*	*233/234/235*		*E.G*	*#695*	*PASS*	*CROSS SEAM*
10/8/2024	*R.569*	*234/235/236*		*E.G*	*#695*	*PASS*	*CROSS SEAM*
10/8/2024	*R.570*		*236*	*E.G*	*#695*	*PASS*	*BOOT 16' FROM R569, 9' FROM 236/237*

New England Liner Systems, Inc. ***Repair Report***

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

Repair Date	*Repair Number*	*Seam Number*	*Panel Numbers*	*Repair Crew*	*Machine Number*	*V-Box Test pass/fail*	*Location Comments*
10/8/2024	*R.571*	*235/236/224*		*E.G*	*#695*	*PASS*	*TIE IN*
10/8/2024	*R.572*	*236/237/224*		*E.G*	*#695*	*PASS*	*TIE IN*
10/8/2024	*R.573*	*237/238/224*		*E.G*	*#695*	*PASS*	*TIE IN*
10/8/2024	*R.574*	*238/239/224*		*E.G*	*#695*	*PASS*	*TIE IN*
10/8/2024	*R.575*	*239/240/224*		*E.G*	*#695*	*PASS*	*TIE IN*
10/8/2024	*R.576*	*239/240/241*		*E.G*	*#695*	*PASS*	*CROSS SEAM*
10/8/2024	*R.577*	*240/241/242*		*E.G*	*#695*	*PASS*	*CROSS SEAM*
10/8/2024	*R.578*		*241*	*E.G*	*#695*	*PASS*	*BOOT 6' FROM R576, 5' FROM 239/241*
10/8/2024	*R.579*	*240/242/224*		*E.G*	*#695*	*PASS*	*TIE IN*
10/8/2024	*R.580*	*242/243/225*		*E.G*	*#695*	*PASS*	*TIE IN*
10/8/2024	*R.581*	*243/244/225*		*E.G*	*#695*	*PASS*	*TIE IN*
10/8/2024	*R.582*		*244*	*E.G*	*#695*	*PASS*	*BOOT 55' FROM R583, 5' FROM 244/245*
10/8/2024	*R.583*	*244/245/225*		*E.G*	*#695*	*PASS*	*TIE IN*
10/8/2024	*R.584*	*2445/246/225*		*E.G*	*#695*	*PASS*	*TIE IN*
10/8/2024	*R.585*	*246/247/225*		*E.G*	*#695*	*PASS*	*TIE IN*
10/8/2024	*R.586*	*247/248/225*		*E.G*	*#695*	*PASS*	*TIE IN*
10/8/2024	*R.587*	*247/248*		*E.G*	*#695*	*PASS*	*BOOT 6' FROM R586*
10/8/2024	*R.588*	*232/233*		*E.G*	*#695*	*PASS*	*DT-102, 60' FROM R566*
10/8/2024	*R.589*	*238/239*		*E.G*	*#695*	*PASS*	*DT-103, 53' FROM R574*
10/8/2024	*R.590*	*242/243*		*E.G*	*#695*	*PASS*	*DT-104, 36' FROM R80*
10/8/2024	*R.591*	*236/237*		*E.G*	*#695*	*PASS*	*DT-105, 60' FROM R572*
10/8/2024	*R.592*	*230/231*		*E.G*	*#695*	*PASS*	*DT-106, 50' R564*
10/8/2024	*R.593*	*237/224*		*E.G*	*#695*	*PASS*	*7' FROM R573*

Appendix G-6 Non-Destructive Test Logs

New England Liner Systems, Inc. — *Non Destructive Test Data*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM SEGMENT*	*TESTER INITIALS*	*PRESSURE PSI START*	*END*	*TEST TIME START*	*END*	*PASS FAIL*	*V-BOX PASS*	*COMMENTS*
6/12/2024	*P-1/P-2*	*M.R*	*30*	*29*	*10:03*	*10:08*	*PASS*	*N/A*	*E.O.S*
6/12/2024	*P-2/P-3*	*M.R*	*30*	*29*	*10:05*	*10:10*	*PASS*	*N/A*	*E.O.S*
6/12/2024	*P-3/P-4*	*M.R*	*30*	*30*	*10:15*	*10:20*	*PASS*	*N/A*	*E.O.S*
6/12/2024	*P-3/P-5*	*M.R*	*30*	*30*	*10:12*	*10:17*	*PASS*	*N/A*	*E.O.S*
6/12/2024	*P-4/P-5*	*C.O*	*30*	*29*	*11:55*	*12:00*	*PASS*	*N/A*	*E.O.S*
6/12/2024	*P-4/P-6*	*C.O*	*30*	*30*	*12:38*	*12:43*	*PASS*	*N/A*	*92' to S/E*
6/12/2024	*P-4/P-6*	*C.O*	*30*	*29*	*12:45*	*12:50*	*PASS*	*N/A*	*92' to E.O.S*
6/12/2024	*P-5/P-6*	*C.O*	*30*	*29*	*12:49*	*12:54*	*PASS*	*N/A*	*25' to S/E*
6/12/2024	*P-5/P-6*	*C.O*	*30*	*29*	*12:53*	*12:58*	*PASS*	*N/A*	*25' to E.O.S*
6/12/2024	*P-6/P-7*	*C.O*	*30*	*29*	*12:58*	*1:03*	*PASS*	*N/A*	*E.O.S*
6/12/2024	*P-7/P-9*	*C.O*	*30*	*29*	*1:02*	*1:07*	*PASS*	*N/A*	*E.O.S*
6/12/2024	*P-7/P-8*	*C.O*	*30*	*29*	*2:06*	*2:11*	*PASS*	*N/A*	*E.O.S*
6/12/2024	*P-8/P-9*	*C.O*	*30*	*29*	*2:02*	*2:07*	*PASS*	*N/A*	*13' to S/W*
6/12/2024	*P-8/P-9*	*C.O*	*30*	*29*	*1:56*	*2:01*	*PASS*	*N/A*	*13' to E.O.S*
6/12/2024	*P-8/P-10*	*C.O*	*30*	*29*	*2:17*	*2:22*	*PASS*	*N/A*	*E.O.S*
6/12/2024	*P-9/P-10*	*C.O*	*30*	*30*	*1:13*	*1:18*	*PASS*	*N/A*	*E.O.S*
6/12/2024	*P-10/P-11*	*C.O*	*30*	*29*	*2:35*	*2:40*	*PASS*	*N/A*	*E.O.S*
6/12/2024	*P-11/P-12*	*C.O*	*30*	*29*	*3:03*	*3:08*	*PASS*	*N/A*	*E.O.S*
6/12/2024	*P-11/P-13*	*C.O*	*30*	*30*	*2:42*	*2:47*	*PASS*	*N/A*	*E.O.S*
6/12/2024	*P-12/P-13*	*C.O*	*30*	*30*	*2:58*	*3:03*	*PASS*	*N/A*	*E.O.S*
6/12/2024	*P-13/P-14*	*C.O*	*30*	*30*	*3:00*	*3:05*	*PASS*	*N/A*	*10' to S/E*
6/12/2024	*P-13/P-14*	*C.O*	*30*	*29*	*3:15*	*3:20*	*PASS*	*N/A*	*40' to 142'*

New England Liner Systems, Inc. — *Non Destructive Test Data*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM SEGMENT*	*TESTER INITIALS*	*PRESSURE PSI START*	*END*	*TEST TIME START*	*END*	*PASS FAIL*	*V-BOX PASS*	*COMMENTS*
6/12/2024	*P-13/P-14*	*C.O*	*30*	*29*	*2:51*	*2:56*	*PASS*	*N/A*	*142' to E.O.S*
6/12/2024	*P-12/P-14*	*C.O*	*30*	*29*	*3:07*	*3:12*	*PASS*	*N/A*	*E.O.S*
6/12/2024	*P-14/P-15*	*C.O*	*30*	*29*	*3:36*	*3:41*	*PASS*	*N/A*	*E.O.S*
6/12/2024	*P-14/P-16*	*C.O*	*30*	*30*	*3:47*	*3:52*	*PASS*	*N/A*	*E.O.S*
6/12/2024	*P-15/P-16*	*C.O*	*30*	*30*	*3:42*	*3:47*	*PASS*	*N/A*	*E.O.S*
6/12/2024	*P-15/P-17*	*C.O*	*30*	*29*	*3:37*	*3:42*	*PASS*	*N/A*	*E.O.S*
6/12/2024	*P-16/P-17*	*C.O*	*30*	*29*	*3:54*	*3:59*	*PASS*	*N/A*	*E.O.S*
6/12/2024	*P-17/P-18*	*C.O*	*30*	*30*	*3:50*	*3:55*	*PASS*	*N/A*	*263' to S/E*
6/12/2024	*P-17/P-18*	*C.O*	*30*	*29*	*3:52*	*3:57*	*PASS*	*N/A*	*263' to E.O.S*
6/12/2024	*P-18/P-19*	*C.O*	*30*	*30*	*4:08*	*4:13*	*PASS*	*N/A*	*96' to S/E*
6/12/2024	*P-18/P-19*	*C.O*	*30*	*30*	*4:10*	*4:15*	*PASS*	*N/A*	*96' to E.O.S*
6/12/2024	*P-18/P-20*	*C.O*	*30*	*29*	*4:00*	*4:05*	*PASS*	*N/A*	*63' to S/E*
6/12/2024	*P-18/P-20*	*C.O*	*30*	*29*	*4:07*	*4:12*	*PASS*	*N/A*	*63' to E.O.S*
6/13/2024	*P-19/P-21*	*C.O*	*30*	*29*	*8:50*	*8:51*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-20/P-21*	*C.O*	*30*	*29*	*8:24*	*8:29*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-21/P-22*	*C.O*	*30*	*29*	*9:03*	*9:08*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-22/P-23*	*C.O*	*30*	*30*	*10:48*	*10:53*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-23/P-24*	*C.O*	*30*	*29*	*10:56*	*11:01*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-22/P-24*	*C.O*	*30*	*29*	*10:46*	*10:51*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-24/P-25*	*C.O*	*30*	*29*	*11:10*	*11:15*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-22/P-25*	*C.O*	*30*	*29*	*10:32*	*10:37*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-25/P-26*	*C.O*	*30*	*29*	*11:26*	*11:31*	*PASS*	*N/A*	*E.O.S*

New England Liner Systems, Inc. — *Non Destructive Test Data*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM SEGMENT*	*TESTER INITIALS*	*PRESSURE PSI START*	*END*	*TEST TIME START*	*END*	*PASS FAIL*	*V-BOX PASS*	*COMMENTS*
6/13/2024	*P-22/P-26*	*C.O*	*30*	*29*	*10:24*	*10:29*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-26/P-27*	*C.O*	*30*	*30*	*11:35*	*11:40*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-22/P-27*	*C.O*	*30*	*29*	*10:12*	*10:17*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-27/P-29*	*C.O*	*30*	*30*	*11:50*	*11:55*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-27/P-29*	*C.O*	*30*	*30*	*11:50*	*11:55*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-22/P-29*	*C.O*	*30*	*29*	*10:05*	*10:10*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-29/P-30*	*C.O*	*30*	*29*	*12:52*	*12:57*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-22/P-30*	*C.O*	*30*	*30*	*9:54*	*9:59*	*PASS*	*N/A*	*15' to S*
6/13/2024	*P-22/P-30*	*C.O*	*30*	*30*	*9:43*	*9:48*	*PASS*	*N/A*	*15' to E.O.S*
6/13/2024	*P-30/P-32*	*C.O*	*30*	*30*	*1:16*	*1:21*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-22/P-32*	*C.O*	*30*	*29*	*8:38*	*8:43*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-26/P-28*	*C.O*	*30*	*29*	*12:37*	*12:42*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-27/P-28*	*C.O*	*30*	*29*	*11:55*	*12:00*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-28/P-29*	*C.O*	*30*	*29*	*12:45*	*12:50*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-32/P-33*	*C.O*	*30*	*30*	*1:25*	*1:30*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-29/P-31*	*C.O*	*30*	*29*	*1:00*	*1:05*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-30/P-31*	*C.O*	*30*	*30*	*1:06*	*1:11*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-31/P-32*	*C.O*	*30*	*29*	*1:12*	*1:17*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-33/P-34*	*C.O*	*30*	*29*	*1:39*	*1:44*	*PASS*	*N/A*	*108' to S/E*
6/13/2024	*P-33/P-34*	*C.O*	*30*	*30*	*1:36*	*1:41*	*PASS*	*N/A*	*108' to E.O.S*
6/13/2024	*P-34/P-35*	*C.O*	*30*	*29*	*1:50*	*1:55*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-35/P-36*	*C.O*	*30*	*30*	*2:06*	*2:11*	*PASS*	*N/A*	*E.O.S*

New England Liner Systems, Inc. — *Non Destructive Test Data*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM SEGMENT*	*TESTER INITIALS*	*PRESSURE PSI START*	*END*	*TEST TIME START*	*END*	*PASS FAIL*	*V-BOX PASS*	*COMMENTS*
6/13/2024	*P-35/P-37*	*C.O*	*30*	*30*	*1:56*	*2:01*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-36/P-37*	*C.O*	*30*	*30*	*1:59*	*2:04*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-36/P-38*	*C.O*	*30*	*29*	*2:07*	*2:12*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-37/P-38*	*C.O*	*30*	*30*	*2:00*	*2:05*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-38/P-39*	*C.O*	*30*	*30*	*2:17*	*2:22*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-39/P-41*	*C.O*	*30*	*30*	*2:16*	*2:21*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-40/P-41*	*C.O*	*30*	*30*	*2:23*	*2:28*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-39/P-40*	*C.O*	*30*	*30*	*2:24*	*2:29*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-40/P-42*	*C.O*	*30*	*30*	*2:33*	*2:38*	*PASS*	*N/A*	*94' to S/E*
6/13/2024	*P-40/P-42*	*C.O*	*30*	*29*	*2:31*	*2:36*	*PASS*	*N/A*	*94' to E.O.S*
6/13/2024	*P-41/P-42*	*C.O*	*30*	*30*	*2:30*	*2:35*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-43/P-44*	*C.O*	*30*	*30*	*2:40*	*2:45*	*PASS*	*N/A*	*132' to S/E*
6/13/2024	*P-43/P-44*	*C.O*	*30*	*30*	*2:44*	*2:49*	*PASS*	*N/A*	*132' to E.O.S*
6/13/2024	*P-43/P-45*	*C.O*	*30*	*30*	*2:57*	*3:02*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-44/P-45*	*C.O*	*30*	*29*	*3:01*	*3:06*	*PASS*	*N/A*	*E.O.S*
6/14/2024	*P-44/P-46*	*C.O*	*30*	*30*	*7:17*	*7:22*	*PASS*	*N/A*	*E.O.S*
6/14/2024	*P-46/P-47*	*C.O*	*30*	*29*	*7:19*	*7:24*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-44/P-47*	*C.O*	*30*	*29*	*3:18*	*3:23*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-47/P-49*	*C.O*	*30*	*29*	*3:19*	*3:24*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-44/P-49*	*C.O*	*30*	*29*	*3:06*	*3:11*	*PASS*	*N/A*	*E.O.S*
6/13/2024	*P-45/P-50*	*C.O*	*30*	*30*	*3:00*	*3:05*	*PASS*	*N/A*	*E.O.S*
6/14/2024	*P-47/P-48*	*C.O*	*30*	*30*	*7:36*	*7:41*	*PASS*	*N/A*	*E.O.S*

New England Liner Systems, Inc. — *Non Destructive Test Data*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM SEGMENT*	*TESTER INITIALS*	*PRESSURE PSI START*	*END*	*TEST TIME START*	*END*	*PASS FAIL*	*V-BOX PASS*	*COMMENTS*
6/14/2024	*P-48/P-49*	*C.O*	*30*	*29*	*7:30*	*7:35*	*PASS*	*N/A*	*E.O.S*
6/14/2024	*P-48/P-50*	*C.O*	*30*	*30*	*7:50*	*7:55*	*PASS*	*N/A*	*10' to N/E*
6/14/2024	*P-48/P-50*	*C.O*	*30*	*30*	*7:44*	*7:49*	*PASS*	*N/A*	*10' to E.O.S*
6/14/2024	*P-49/P-50*	*C.O*	*30*	*30*	*3:12*	*3:17*	*PASS*	*N/A*	*E.O.S*
6/14/2024	*P-50/P-51*	*C.O*	*30*	*29*	*7:53*	*7:58*	*PASS*	*N/A*	*146' to E*
6/14/2024	*P-50/P-51*	*C.O*	*30*	*29*	*8:01*	*8:06*	*PASS*	*N/A*	*146' to 193'*
6/14/2024	*P-50/P-51*	*C.O*	*30*	*29*	*8:07*	*8:12*	*PASS*	*N/A*	*193' to E.O.S*
6/14/2024	*P-51/P-52*	*C.O*	*30*	*29*	*8:30*	*8:35*	*PASS*	*N/A*	*E.O.S*
6/14/2024	*P-51/P-53*	*C.O*	*30*	*30*	*8:15*	*8:20*	*PASS*	*N/A*	*E.O.S*
6/14/2024	*P-52/P-53*	*C.O*	*30*	*29*	*8:23*	*8:28*	*PASS*	*N/A*	*E.O.S*
6/14/2024	*P-52/P-54*	*C.O*	*30*	*30*	*8:38*	*8:43*	*PASS*	*N/A*	*E.O.S*
6/14/2024	*P-53/P-54*	*C.O*	*30*	*29*	*8:42*	*8:47*	*PASS*	*N/A*	*E.O.S*
6/14/2024	*P-54/P-55*	*C.O*	*30*	*29*	*8:54*	*8:59*	*PASS*	*N/A*	*E.O.S*
6/14/2024	*P-55/P-56*	*C.O*	*30*	*29*	*9:03*	*9:08*	*PASS*	*N/A*	*E.O.S*
6/14/2024	*P-56/P-57*	*C.O*	*30*	*29*	*9:16*	*9:21*	*PASS*	*N/A*	*126' to E*
6/14/2024	*P-56/P-57*	*C.O*	*30*	*29*	*9:22*	*9:27*	*PASS*	*N/A*	*126' to E.O.S*
6/14/2024	*P-57/P-58*	*C.O*	*30*	*29*	*9:35*	*9:40*	*PASS*	*N/A*	*E.O.S*
6/14/2024	*P-58/P-59*	*C.O*	*30*	*30*	*9:48*	*9:53*	*PASS*	*N/A*	*E.O.S*
6/14/2024	*P-59/P-60*	*C.O*	*30*	*30*	*9:59*	*10:04*	*PASS*	*N/A*	*E.O.S*
6/14/2024	*P-59/P-61*	*C.O*	*30*	*30*	*9:54*	*9:59*	*PASS*	*N/A*	*E.O.S*
6/14/2024	*P-60/P-61*	*C.O*	*30*	*29*	*10:04*	*10:09*	*PASS*	*N/A*	*E.O.S*
6/14/2024	*P-60/P-62*	*C.O*	*30*	*30*	*10:00*	*10:05*	*PASS*	*N/A*	*E.O.S*

New England Liner Systems, Inc. — *Non Destructive Test Data*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM SEGMENT*	*TESTER INITIALS*	*PRESSURE PSI START*	*END*	*TEST TIME START*	*END*	*PASS FAIL*	*V-BOX PASS*	*COMMENTS*
6/14/2024	*P-61/P-62*	*C.O*	*30*	*30*	*10:09*	*10:14*	*PASS*	*N/A*	*E.O.S*
6/14/2024	*P-62/P-63*	*C.O*	*30*	*30*	*10:14*	*10:19*	*PASS*	*N/A*	*E.O.S*
6/14/2024	*P-63/P-64*	*C.O*	*30*	*29*	*10:18*	*10:23*	*PASS*	*N/A*	*E.O.S*
6/14/2024	*P-64/P-65*	*C.O*	*30*	*30*	*10:35*	*10:40*	*PASS*	*N/A*	*E.O.S*
6/14/2024	*P-64/P-66*	*C.O*	*30*	*30*	*10:25*	*10:30*	*PASS*	*N/A*	*E.O.S*
6/14/2024	*P-65/P-66*	*C.O*	*30*	*29*	*10:35*	*10:40*	*PASS*	*N/A*	*E.O.S*
6/14/2024	*P-65/P-67*	*C.O*	*30*	*29*	*10:41*	*10:46*	*PASS*	*N/A*	*E.O.S*
6/14/2024	*P-66/P-67*	*C.O*	*30*	*29*	*10:25*	*10:30*	*PASS*	*N/A*	*E.O.S*
6/14/2024	*P-67/P-68*	*C.O*	*30*	*30*	*10:48*	*10:53*	*PASS*	*N/A*	*E.O.S*
6/14/2024	*P-68/P-69*	*C.O*	*30*	*29*	*10:49*	*10:54*	*PASS*	*N/A*	*E.O.S*
6/18/2024	*P-69/P-70*	*C.O*	*30*	*30*	*10:49*	*10:54*	*PASS*	*N/A*	*E.O.S*
6/18/2024	*P-70/P-71*	*C.O*	*30*	*29*	*10:41*	*10:46*	*PASS*	*N/A*	*E.O.S*
6/18/2024	*P-69/P-71*	*C.O*	*30*	*29*	*10:48*	*10:53*	*PASS*	*N/A*	*E.O.S*
6/18/2024	*P-70/P-72*	*C.O*	*30*	*29*	*10:56*	*11:01*	*PASS*	*N/A*	*E.O.S*
6/18/2024	*P-71/P-72*	*C.O*	*30*	*29*	*11:04*	*11:09*	*PASS*	*N/A*	*6' to E*
6/18/2024	*P-71/P-72*	*C.O*	*30*	*29*	*11:12*	*11:17*	*PASS*	*N/A*	*6' to 19'*
6/18/2024	*P-71/P-72*	*C.O*	*30*	*30*	*11:19*	*11:24*	*PASS*	*N/A*	*19' to 42'*
6/18/2024	*P-71/P-72*	*C.O*	*30*	*29*	*11:26*	*11:31*	*PASS*	*N/A*	*42' to 60'*
6/18/2024	*P-71/P-72*	*C.O*	*30*	*29*	*11:32*	*11:37*	*PASS*	*N/A*	*60' to 67'*
6/18/2024	*P-71/P-72*	*C.O*	*30*	*29*	*11:38*	*11:43*	*PASS*	*N/A*	*67' to E.O.S*
6/18/2024	*P-72/P-73*	*C.O*	*30*	*30*	*12:38*	*12:43*	*PASS*	*N/A*	*121' to E*
6/18/2024	*P-72/P-73*	*C.O*	*30*	*30*	*11:53*	*11:58*	*PASS*	*N/A*	*121' to E.O.S*

New England Liner Systems, Inc. — *Non Destructive Test Data*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM SEGMENT*	*TESTER INITIALS*	*PRESSURE PSI START*	*END*	*TEST TIME START*	*END*	*PASS FAIL*	*V-BOX PASS*	*COMMENTS*
6/18/2024	*P-73/P-74*	*C.O*	*30*	*30*	*11:55*	*12:00*	*PASS*	*N/A*	*10' to E*
6/18/2024	*P-73/P-74*	*C.O*	*30*	*30*	*2:47*	*2:52*	*PASS*	*N/A*	*10' to 65'*
6/18/2024	*P-73/P-74*	*C.O*	*30*	*29*	*2:46*	*2:51*	*PASS*	*N/A*	*65' to 73'*
6/18/2024	*P-73/P-74*	*C.O*	*30*	*29*	*2:44*	*2:49*	*PASS*	*N/A*	*73' to E.O.S*
6/18/2024	*P-74/P-75*	*C.O*	*30*	*30*	*1:40*	*1:45*	*PASS*	*N/A*	*41' to E*
6/18/2024	*P-74/P-75*	*C.O*	*30*	*30*	*1:32*	*1:37*	*PASS*	*N/A*	*41' to E.O.S*
6/18/2024	*P-75/P-76*	*C.O*	*30*	*29*	*1:54*	*1:59*	*PASS*	*N/A*	*6' to S*
6/18/2024	*P-75/P-76*	*C.O*	*30*	*29*	*11:51*	*11:56*	*PASS*	*N/A*	*6' to E.O.S*
6/18/2024	*P-74/P-76*	*C.O*	*30*	*30*	*1:20*	*1:25*	*PASS*	*N/A*	*E.O.S*
6/18/2024	*P-75/P-77*	*C.O*	*30*	*30*	*1:50*	*1:55*	*PASS*	*N/A*	*E.O.S*
6/18/2024	*P-76/P-77*	*C.O*	*30*	*29*	*2:03*	*2:08*	*PASS*	*N/A*	*18' to E*
6/18/2024	*P-76/P-77*	*C.O*	*30*	*29*	*2:12*	*2:17*	*PASS*	*N/A*	*18' to E.O.S*
6/18/2024	*P-77/P-78*	*C.O*	*30*	*29*	*2:14*	*2:19*	*PASS*	*N/A*	*E.O.S*
6/18/2024	*P-78/P-80*	*C.O*	*30*	*30*	*3:08*	*3:13*	*PASS*	*N/A*	*10' to E*
6/18/2024	*P-78/P-80*	*C.O*	*30*	*29*	*3:07*	*3:12*	*PASS*	*N/A*	*10' to E.O.S*
6/18/2024	*P-79/P-80*	*C.O*	*30*	*30*	*3:14*	*3:19*	*PASS*	*N/A*	*E.O.S*
6/18/2024	*P-78/P-79*	*C.O*	*30*	*30*	*3:01*	*3:06*	*PASS*	*N/A*	*122' to E*
6/18/2024	*P-78/P-79*	*C.O*	*30*	*30*	*2:53*	*2:58*	*PASS*	*N/A*	*122' to E.O.S*
6/18/2024	*P-80/P-81*	*C.O*	*30*	*29*	*3:15*	*3:20*	*PASS*	*N/A*	*E.O.S*
6/18/2024	*P-79/P-81*	*C.O*	*30*	*30*	*3:00*	*3:05*	*PASS*	*N/A*	*78' to E*
6/18/2024	*P-79/P-81*	*C.O*	*30*	*29*	*2:55*	*3:00*	*PASS*	*N/A*	*78' to E.O.S*
6/18/2024	*P-81/P-82*	*C.O*	*30*	*29*	*3:25*	*3:30*	*PASS*	*N/A*	*E.O.S*

New England Liner Systems, Inc. — *Non Destructive Test Data*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	SEAM SEGMENT	TESTER INITIALS	PRESSURE PSI START	PRESSURE PSI END	TEST TIME START	TEST TIME END	PASS FAIL	V-BOX PASS	COMMENTS
6/19/2024	P-82/P-83	C.O	30	29	1:19	1:24	PASS	N/A	E.O.S
6/19/2024	P-83/P-84	C.O	30	29	1:49	1:54	PASS	N/A	E.O.S
6/19/2024	P-84/P-85	C.O	30	29	1:57	2:02	PASS	N/A	E.O.S
6/19/2024	P-84/P-86	C.O	30	29	2:17	2:22	PASS	N/A	E.O.S
6/19/2024	P-84/P-87	C.O	30	30	2:33	2:38	PASS	N/A	E.O.S
6/19/2024	P-84/P-88	C.O	30	29	2:49	2:54	PASS	N/A	E.O.S
6/19/2024	P-84/P-89	C.O	30	29	3:05	3:10	PASS	N/A	E.O.S
6/19/2024	P-85/P-86	C.O	30	30	2:03	2:08	PASS	N/A	E.O.S
6/19/2024	P-86/P-87	C.O	30	29	2:24	2:29	PASS	N/A	E.O.S
6/19/2024	P-87/P-88	C.O	30	30	2:41	2:46	PASS	N/A	E.O.S
6/19/2024	P-88/P-89	C.O	30	30	2:57	3:02	PASS	N/A	E.O.S
6/20/2024	P-89/P-91	C.O	30	29	8:36	8:41	PASS	N/A	50' to N/E
6/20/2024	P-89/P-91	C.O	30	29	8:29	8:34	PASS	N/A	50' to 91'
6/20/2024	P-89/P-91	C.O	30	29	8:21	8:26	PASS	N/A	91' to 147'
6/20/2024	P-89/P-91	C.O	30	29	6:19	6:24	PASS	N/A	147' to E.O.S
6/20/2024	P-90/P-91	C.O	30	29	8:41	8:46	PASS	N/A	E.O.S
6/20/2024	P-89/P-90	C.O	30	30	3:12	3:17	PASS	N/A	E.O.S
6/20/2024	P-84/P-90	C.O	30	30	3:02	3:07	PASS	N/A	E.O.S
6/20/2024	P-91/P-92	C.O	30	29	9:45	9:50	PASS	N/A	161' to N/E
6/20/2024	P-91/P-92	C.O	30	29	9:55	10:00	PASS	N/A	161' to E.O.S
6/20/2024	P-90/P-92	C.O	30	29	9:57	10:02	PASS	N/A	49' to N/E
6/20/2024	P-90/P-92	C.O	30	30	9:56	10:01	PASS	N/A	49' to E.O.S

New England Liner Systems, Inc. — *Non Destructive Test Data*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM SEGMENT*	*TESTER INITIALS*	*PRESSURE PSI START*	*END*	*TEST TIME START*	*END*	*PASS FAIL*	*V-BOX PASS*	*COMMENTS*
6/20/2024	*P-92/P-93*	*C.O*	*30*	*30*	*9:34*	*9:39*	*PASS*	*N/A*	*183' to N/E*
6/20/2024	*P-92/P-93*	*C.O*	*30*	*29*	*9:23*	*9:28*	*PASS*	*N/A*	*183' to E.O.S*
6/20/2024	*P-93/P-94*	*C.O*	*30*	*29*	*10:11*	*10:16*	*PASS*	*N/A*	*E.O.S*
6/20/2024	*P-94/P-95*	*C.O*	*30*	*30*	*10:23*	*10:28*	*PASS*	*N/A*	*E.O.S*
6/20/2024	*P-95/P-96*	*C.O*	*30*	*30*	*11:06*	*11:11*	*PASS*	*N/A*	*E.O.S*
6/20/2024	*P-96/P-97*	*C.O*	*30*	*29*	*11:42*	*11:47*	*PASS*	*N/A*	*E.O.S*
6/20/2024	*P-97/P-98*	*C.O*	*30*	*29*	*12:50*	*12:55*	*PASS*	*N/A*	*E.O.S*
6/20/2024	*P-96/P-98*	*C.O*	*30*	*30*	*11:33*	*11:38*	*PASS*	*N/A*	*E.O.S*
6/20/2024	*P-98/P-99*	*C.O*	*30*	*29*	*1:10*	*1:15*	*PASS*	*N/A*	*E.O.S*
6/20/2024	*P-99/P-100*	*C.O*	*30*	*30*	*1:14*	*1:19*	*PASS*	*N/A*	*E.O.S*
6/20/2024	*P-98/P-100*	*C.O*	*30*	*29*	*1:04*	*1:09*	*PASS*	*N/A*	*29' to N/E*
6/20/2024	*P-98/P-100*	*C.O*	*30*	*29*	*1:00*	*1:05*	*PASS*	*N/A*	*29' to E.O.S*
6/20/2024	*P-100/P-101*	*C.O*	*30*	*29*	*1:07*	*1:12*	*PASS*	*N/A*	*E.O.S*
6/20/2024	*P-98/P-101*	*C.O*	*30*	*30*	*12:56*	*1:01*	*PASS*	*N/A*	*E.O.S*
6/20/2024	*P-96/P-101*	*C.O*	*30*	*30*	*11:14*	*11:19*	*PASS*	*N/A*	*E.O.S*
6/20/2024	*P-95/P-101*	*C.O*	*30*	*29*	*10:31*	*10:36*	*PASS*	*N/A*	*E.O.S*
6/20/2024	*P-94/P-101*	*C.O*	*30*	*29*	*10:41*	*10:46*	*PASS*	*N/A*	*E.O.S*
6/20/2024	*P-94/P-102*	*C.O*	*30*	*30*	*10:45*	*10:50*	*PASS*	*N/A*	*E.O.S*
6/20/2024	*P-101/P-102*	*C.O*	*30*	*29*	*10:55*	*11:00*	*PASS*	*N/A*	*87' to N/W*
6/20/2024	*P-101/P-102*	*C.O*	*30*	*29*	*10:49*	*10:54*	*PASS*	*N/A*	*87' to E.O.S*
6/20/2024	*P-102/P-103*	*C.O*	*30*	*29*	*1:21*	*1:26*	*PASS*	*N/A*	*41' to N/W*
6/20/2024	*P-102/P-103*	*C.O*	*30*	*30*	*1:25*	*1:30*	*PASS*	*N/A*	*41' to 58'*

New England Liner Systems, Inc. — *Non Destructive Test Data*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM SEGMENT*	*TESTER INITIALS*	*PRESSURE PSI START*	*END*	*TEST TIME START*	*END*	*PASS FAIL*	*V-BOX PASS*	*COMMENTS*
6/20/2024	*P-102/P-103*	*C.O*	*30*	*29*	*1:24*	*1:29*	*PASS*	*N/A*	*58' to E.O.S*
6/20/2024	*P-94/P-103*	*C.O*	*30*	*29*	*1:36*	*1:41*	*PASS*	*N/A*	*E.O.S*
6/20/2024	*P-93/P-103*	*C.O*	*30*	*30*	*1:40*	*1:45*	*PASS*	*N/A*	*E.O.S*
6/20/2024	*P-92/P-103*	*C.O*	*30*	*30*	*1:54*	*1:59*	*PASS*	*N/A*	*E.O.S*
6/20/2024	*P-90/P-103*	*C.O*	*30*	*29*	*1:52*	*1:57*	*PASS*	*N/A*	*E.O.S*
6/21/2024	*P-84/P-103*	*C.O*	*30*	*30*	*6:16*	*6:21*	*PASS*	*N/A*	*E.O.S*
6/21/2024	*P-83/P-103*	*C.O*	*30*	*29*	*6:25*	*6:30*	*PASS*	*N/A*	*E.O.S*
6/21/2024	*P-103/P-104*	*C.O*	*30*	*29*	*7:46*	*7:51*	*PASS*	*N/A*	*5' to N/W*
6/21/2024	*P-103/P-104*	*C.O*	*30*	*30*	*7:40*	*7:45*	*PASS*	*N/A*	*5' to 65'*
6/21/2024	*P-103/P-104*	*C.O*	*30*	*30*	*7:30*	*7:35*	*PASS*	*N/A*	*65' to 77'*
6/21/2024	*P-103/P-104*	*C.O*	*30*	*30*	*7:22*	*7:27*	*PASS*	*N/A*	*77' to 101'*
6/21/2024	*P-103/P-104*	*C.O*	*30*	*29*	*7:14*	*7:19*	*PASS*	*N/A*	*101' to 115'*
6/21/2024	*P-103/P-104*	*C.O*	*30*	*30*	*6:42*	*6:47*	*PASS*	*N/A*	*115' to 129'*
6/21/2024	*P-103/P-104*	*C.O*	*30*	*30*	*6:34*	*6:39*	*PASS*	*N/A*	*129' to E.O.S*
6/21/2024	*P-104/P-106*	*C.O*	*30*	*29*	*8:14*	*8:19*	*PASS*	*N/A*	*E.O.S*
6/21/2024	*P-104/P-105*	*C.O*	*30*	*29*	*8:10*	*8:15*	*PASS*	*N/A*	*E.O.S*
6/21/2024	*P-105/P-106*	*C.O*	*30*	*30*	*8:30*	*8:35*	*PASS*	*N/A*	*E.O.S*
6/21/2024	*P-105/P-107*	*C.O*	*30*	*29*	*8:27*	*8:32*	*PASS*	*N/A*	*E.O.S*
6/21/2024	*P-106/P-107*	*C.O*	*30*	*29*	*8:23*	*8:28*	*PASS*	*N/A*	*E.O.S*
6/21/2024	*P-107/P-108*	*C.O*	*30*	*29*	*8:34*	*8:39*	*PASS*	*N/A*	*86' to N/W*
6/21/2024	*P-107/P-108*	*C.O*	*30*	*30*	*8:36*	*8:41*	*PASS*	*N/A*	*86' to 110'*
6/21/2024	*P-107/P-108*	*C.O*	*30*	*30*	*8:43*	*8:48*	*PASS*	*N/A*	*110' to E.O.S*

New England Liner Systems, Inc. — *Non Destructive Test Data*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	SEAM SEGMENT	TESTER INITIALS	PRESSURE PSI START	PRESSURE PSI END	TEST TIME START	TEST TIME END	PASS FAIL	V-BOX PASS	COMMENTS
6/21/2024	P-97/P-98	C.O	30	29	11:50	11:55	PASS	N/A	5' to N/W
6/25/2024	P-108/P-109	C.O	30	29	10:50	10:55	PASS	N/A	E.O.S
6/25/2024	P-108/P-110	C.O	30	30	10:40	10:45	PASS	N/A	E.O.S
6/25/2024	P-109/P-110	C.O	30	29	10:43	10:48	PASS	N/A	E.O.S
6/25/2024	P-109/P-111	C.O	30	30	10:52	10:57	PASS	N/A	E.O.S
6/25/2024	P-110/P-111	C.O	30	30	10:44	0.728472	PASS	N/A	E.O.S
6/25/2024	P-111/P-112	C.O	30	29	10:59	11:-04	PASS	N/A	E.O.S
6/25/2024	P-112/P-113	C.O	30	30	11:02	11:07	PASS	N/A	E.O.S
6/25/2024	P-113/P-114	C.O	30	30	11:08	11:13	PASS	N/A	E.O.S
6/25/2024	P-114/P-115	C.O	30	30	11:31	11:36	PASS	N/A	E.O.S
6/25/2024	P-115/P-116	C.O	30	29	11:25	11:30	PASS	N/A	E.O.S
6/25/2024	P-114/P-116	C.O	30	29	11:19	11:24	PASS	N/A	E.O.S
6/25/2024	P-115/P-117	C.O	30	30	1:02	1:07	PASS	N/A	E.O.S
6/25/2024	P-116/P-117	C.O	30	30	1:10	1:15	PASS	N/A	93' to N/W
6/25/2024	P-116/P-117	C.O	30	29	1:16	1:21	PASS	N/A	93' to E.O.S
6/25/2024	P-117/P-118	C.O	30	29	1:26	1:31	PASS	N/A	17' to N/W
6/25/2024	P-117/P-118	C.O	30	29	1:17	1:22	PASS	N/A	17' to E.O.S
6/25/2024	P-118/P-120	C.O	30	29	2:17	2:22	PASS	N/A	14' to N/W
6/25/2024	P-118/P-120	C.O	30	29	2:11	2:16	PASS	N/A	14' to E.O.S
6/25/2024	P-119/P-120	C.O	30	29	2:22	2:27	PASS	N/A	E.O.S
6/25/2024	P-118/P-119	C.O	30	29	2:05	2:10	PASS	N/A	70' to N/W
6/25/2024	P-118/P-119	C.O	30	29	2:00	2:05	PASS	N/A	70' to 91'

New England Liner Systems, Inc. — *Non Destructive Test Data*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM SEGMENT*	*TESTER INITIALS*	*PRESSURE PSI START*	*END*	*TEST TIME START*	*END*	*PASS FAIL*	*V-BOX PASS*	*COMMENTS*
6/25/2024	*P-118/P-119*	*C.O*	*30*	*29*	*1:46*	*1:51*	*PASS*	*N/A*	*91' tp 100'*
6/25/2024	*P-118/P-119*	*C.O*	*30*	*29*	*1:45*	*1:50*	*PASS*	*N/A*	*100' to E.O.S*
6/25/2024	*P-120/P-121*	*C.O*	*30*	*30*	*2:35*	*2:40*	*PASS*	*N/A*	*E.O.S*
6/25/2024	*P-119/P-121*	*C.O*	*30*	*29*	*2:43*	*2:48*	*PASS*	*N/A*	*E.O.S*
6/26/2024	*P-121/P-122*	*C.O*	*30*	*29*	*6:33*	*6:38*	*PASS*	*N/A*	*E.O.S*
6/26/2024	*P-122/P-123*	*C.O*	*30*	*30*	*6:47*	*6:52*	*PASS*	*N/A*	*E.O.S*
6/26/2024	*P-123/P-124*	*C.O*	*30*	*29*	*7:01*	*7:06*	*PASS*	*N/A*	*E.O.S*
6/26/2024	*P-124/P-125*	*C.O*	*30*	*30*	*7:09*	*7:14*	*PASS*	*N/A*	*E.O.S*
6/26/2024	*P-123/P-125*	*C.O*	*30*	*29*	*6:54*	*6:59*	*PASS*	*N/A*	*E.O.S*
6/26/2024	*P-122/P-125*	*C.O*	*30*	*29*	*6:40*	*6:45*	*PASS*	*N/A*	*E.O.S*
6/26/2024	*P-121/P-1125*	*C.O*	*30*	*29*	*6:20*	*6:25*	*PASS*	*N/A*	*E.O.S*
6/25/2024	*P-119/P-125*	*C.O*	*30*	*29*	*2:50*	*2:55*	*PASS*	*N/A*	*E.O.S*
6/26/2024	*P-118/P-125*	*C.O*	*30*	*29*	*6:13*	*6:18*	*PASS*	*N/A*	*E.O.S*
6/26/2024	*P-125/P-126*	*C.O*	*30*	*30*	*8:45*	*8:50*	*PASS*	*N/A*	*E.O.S*
6/26/2024	*P-126/P-127*	*C.O*	*30*	*30*	*8:56*	*9:01*	*PASS*	*N/A*	*E.O.S*
6/26/2024	*P-127/P-129*	*C.O*	*30*	*29*	*9:56*	*10:01*	*PASS*	*N/A*	*183' to W*
6/26/2024	*P-127/P-129*	*C.O*	*30*	*30*	*9:47*	*9:52*	*PASS*	*N/A*	*183' to E.O.S*
6/26/2024	*P-127/P-128*	*C.O*	*30*	*29*	*9:05*	*9:10*	*PASS*	*N/A*	*E.O.S*
6/26/2024	*P-128/P-129*	*C.O*	*30*	*29*	*9:13*	*9:18*	*PASS*	*N/A*	*E.O.S*
6/26/2024	*P-129/P-130*	*C.O*	*30*	*30*	*10:06*	*10:11*	*PASS*	*N/A*	*E.O.S*
6/26/2024	*P-130/P-131*	*C.O*	*30*	*30*	*10:22*	*10:27*	*PASS*	*N/A*	*E.O.S*
6/26/2024	*P-131/P-132*	*C.O*	*30*	*29*	*10:40*	*10:45*	*PASS*	*N/A*	*227' to W*

New England Liner Systems, Inc. — *Non Destructive Test Data*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM SEGMENT*	*TESTER INITIALS*	*PRESSURE PSI START*	*END*	*TEST TIME START*	*END*	*PASS FAIL*	*V-BOX PASS*	*COMMENTS*
6/26/2024	*P-131/P-132*	*C.O*	*30*	*29*	*10:31*	*10:"36*	*PASS*	*N/A*	*227' to E.O.S*
6/26/2024	*P-133/P-134*	*C.O*	*30*	*30*	*2:02*	*2:07*	*PASS*	*N/A*	*E.O.S*
6/26/2024	*P-134/P-135*	*C.O*	*30*	*29*	*2:07*	*2:12*	*PASS*	*N/A*	*E.O.S*
6/26/2024	*P-133/P-135*	*C.O*	*30*	*30*	*2:14*	*2:19*	*PASS*	*N/A*	*E.O.S*
6/26/2024	*P-132/P-133*	*C.O*	*30*	*30*	*1:35*	*1:40*	*PASS*	*N/A*	*97' to W*
6/26/2024	*P-132/P-133*	*C.O*	*30*	*30*	*1:28*	*1:33*	*PASS*	*N/A*	*97' to E.O.S*
6/27/2024	*P-134/P-136*	*C.O*	*30*	*30*	*10:42*	*10:47*	*PASS*	*N/A*	*E.O.S*
6/27/2024	*P-135/P-136*	*C.O*	*30*	*29*	*10:51*	*10:56*	*PASS*	*N/A*	*7' to W*
6/27/2024	*P-135/P-136*	*C.O*	*30*	*29*	*11:00*	*11:05*	*PASS*	*N/A*	*7' to E.O.S*
6/27/2024	*P-136/P-137*	*C.O*	*30*	*29*	*12:32*	*12:37*	*PASS*	*N/A*	*190' to W*
6/27/2024	*P-136/P-137*	*C.O*	*30*	*29*	*11:44*	*11:49*	*PASS*	*N/A*	*190' to E.O.S*
6/27/2024	*P-137/P-138*	*C.O*	*30*	*30*	*1:01*	*1:06*	*PASS*	*N/A*	*105' to W*
6/27/2024	*P-137/P-138*	*C.O*	*30*	*29*	*12:54*	*12:59*	*PASS*	*N/A*	*105' to E.O.S*
6/27/2024	*P-137/P-139*	*C.O*	*30*	*30*	*12:40*	*12:46*	*PASS*	*N/A*	*E.O.S*
6/27/2024	*P-138/P-139*	*C.O*	*30*	*29*	*12:46*	*12:51*	*PASS*	*N/A*	*E.O.S*
6/27/2024	*P-138/P-140*	*C.O*	*30*	*30*	*1:19*	*1:24*	*PASS*	*N/A*	*E.O.S*
6/27/2024	*P-139/P-140*	*C.O*	*30*	*29*	*1:10*	*1:15*	*PASS*	*N/A*	*E.O.S*
6/27/2024	*P-140/P-141*	*C.O*	*30*	*29*	*1:33*	*1:38*	*PASS*	*N/A*	*E.O.S*
6/27/2024	*P-141/P-142*	*C.O*	*30*	*30*	*2:13*	*2:18*	*PASS*	*N/A*	*88' to W*
6/27/2024	*P-141/P-142*	*C.O*	*30*	*29*	*2:06*	*2:11*	*PASS*	*N/A*	*88' to E.O.S*
6/27/2024	*P-142/P-143*	*C.O*	*30*	*30*	*1:59*	*2:04*	*PASS*	*N/A*	*E.O.S*
6/27/2024	*P-141/P-143*	*C.O*	*30*	*29*	*1:51*	*1:56*	*PASS*	*N/A*	*E.O.S*

New England Liner Systems, Inc. — *Non Destructive Test Data*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM SEGMENT*	*TESTER INITIALS*	*PRESSURE PSI START*	*END*	*TEST TIME START*	*END*	*PASS FAIL*	*V-BOX PASS*	*COMMENTS*
6/27/2024	*P-142/P-144*	*C.O*	*30*	*30*	*2:22*	*2:27*	*PASS*	*N/A*	*E.O.S*
6/27/2024	*P-143/P-144*	*C.O*	*30*	*29*	*2:29*	*2:34*	*PASS*	*N/A*	*E.O.S*
6/27/2024	*P-144/P-145*	*C.O*	*30*	*30*	*2:45*	*2:50*	*PASS*	*N/A*	*187' to W*
6/27/2024	*P-144/P-145*	*C.O*	*30*	*30*	*2:37*	*2:42*	*PASS*	*N/A*	*187' to E.O.S*
6/27/2024	*P-145/P-147*	*C.O*	*30*	*29*	*3:07*	*3:12*	*PASS*	*N/A*	*E.O.S*
6/27/2024	*P-146/P-147*	*C.O*	*30*	*29*	*3:01*	*3:06*	*PASS*	*N/A*	*E.O.S*
6/27/2024	*P-145/P-146*	*C.O*	*30*	*29*	*2:55*	*3:00*	*PASS*	*N/A*	*E.O.S*
6/28/2024	*P-147/P-148*	*C.O*	*30*	*30*	*10:31*	*10:36*	*PASS*	*N/A*	*E.O.S*
6/28/2024	*P-146/P-148*	*C.O*	*30*	*29*	*10:22*	*10:27*	*PASS*	*N/A*	*E.O.S*
6/28/2024	*P-148/P-149*	*C.O*	*30*	*29*	*11:00*	*11:05*	*PASS*	*N/A*	*E.O.S*
6/28/2024	*P-148/P-150*	*C.O*	*30*	*29*	*10:37*	*10:42*	*PASS*	*N/A*	*E.O.S*
6/28/2024	*P-149/P-150*	*C.O*	*30*	*29*	*10:43*	*10:48*	*PASS*	*N/A*	*E.O.S*
6/28/2024	*P-149/P-151*	*C.O*	*30*	*30*	*11:08*	*11:13*	*PASS*	*N/A*	*E.O.S*
6/28/2024	*P-151/P-152*	*C.O*	*30*	*30*	*11:17*	*11:22*	*PASS*	*N/A*	*E.O.S*
6/28/2024	*P-152/P-153*	*C.O*	*30*	*30*	*11:26*	*11:31*	*PASS*	*N/A*	*E.O.S*
6/28/2024	*P-153/P-154*	*C.O*	*30*	*30*	*11:33*	*11:38*	*PASS*	*N/A*	*E.O.S*
6/28/2024	*P-153/P-155*	*C.O*	*30*	*30*	*11:48*	*11:53*	*PASS*	*N/A*	*E.O.S*
6/28/2024	*P-154/P-155*	*C.O*	*30*	*29*	*11:39*	*11:44*	*PASS*	*N/A*	*E.O.S*
6/28/2024	*P-154/P-156*	*C.O*	*30*	*30*	*12:02*	*12:07*	*PASS*	*N/A*	*E.O.S*
6/28/2024	*P-155/P-156*	*C.O*	*30*	*30*	*11:54*	*11:59*	*PASS*	*N/A*	*E.O.S*
6/28/2024	*P-156/P-157*	*C.O*	*30*	*30*	*12:35*	*12:40*	*PASS*	*N/A*	*E.O.S*
6/28/2024	*P-157/P-158*	*C.O*	*30*	*29*	*12:40*	*12:45*	*PASS*	*N/A*	*E.O.S*

New England Liner Systems, Inc. — *Non Destructive Test Data*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM SEGMENT*	*TESTER INITIALS*	*PRESSURE PSI START*	*END*	*TEST TIME START*	*END*	*PASS FAIL*	*V-BOX PASS*	*COMMENTS*
6/28/2024	*P-158/P-159*	*C.O*	*30*	*30*	*12:43*	*12:48*	*PASS*	*N/A*	*95' to W*
6/28/2024	*P-158/P-159*	*C.O*	*30*	*30*	*12:48*	*12:53*	*PASS*	*N/A*	*95' to E.O.S*
6/28/2024	*P-159/P-160*	*C.O*	*30*	*30*	*12:55*	*1:00*	*PASS*	*N/A*	*E.O.S*
7/18/2024	*P-161/P-163*	*C.O*	*30*	*30*	*9:15*	*9:20*	*PASS*	*N/A*	*E.O.S*
7/18/2024	*P-162/P-163*	*C.O*	*30*	*29*	*9:10*	*9:15*	*PASS*	*N/A*	*E.O.S*
7/19/2024	*P-163/P-164*	*C.O*	*30*	*30*	*1:57*	*2:02*	*PASS*	*N/A*	*E.O.S*
7/19/2024	*P-164/P-165*	*C.O*	*30*	*29*	*2:15*	*2:20*	*PASS*	*N/A*	*E.O.S*
7/19/2024	*P-164/P-166*	*C.O*	*30*	*29*	*2:09*	*2:14*	*PASS*	*N/A*	*E.O.S*
7/19/2024	*P-163/P-166*	*C.O*	*30*	*29*	*2:27*	*2:32*	*PASS*	*N/A*	*E.O.S*
7/19/2024	*P-165/P-166*	*C.O*	*30*	*30*	*2:03*	*2:08*	*PASS*	*N/A*	*E.O.S*
7/19/2024	*P-165/P-167*	*C.O*	*30*	*30*	*2:21*	*2:26*	*PASS*	*N/A*	*E.O.S*
7/19/2024	*P-166/P-167*	*C.O*	*30*	*29*	*2:33*	*2:38*	*PASS*	*N/A*	*E.O.S*
7/22/2024	*P-167/P-168*	*C.O*	*30*	*30*	*9:51*	*9:56*	*PASS*	*N/A*	*E.O.S*
7/22/2024	*P-168/P-169*	*C.O*	*30*	*30*	*10:12*	*10:17*	*PASS*	*N/A*	*191' to S*
7/22/2024	*P-168/P-169*	*C.O*	*30*	*29*	*10:02*	*10:07*	*PASS*	*N/A*	*191' to E.O.S*
7/22/2024	*P-169/P-170*	*C.O*	*30*	*30*	*10:55*	*11:00*	*PASS*	*N/A*	*92' to S*
7/22/2024	*P-169/P-170*	*C.O*	*30*	*29*	*10:49*	*10:54*	*PASS*	*N/A*	*92' to 574'*
7/22/2024	*P-169/P-170*	*C.O*	*30*	*30*	*10:39*	*10:44*	*PASS*	*N/A*	*574' to E.O.S*
7/22/2024	*P-170/P-171*	*C.O*	*30*	*29*	*11:30*	*11:35*	*PASS*	*N/A*	*E.O.S*
7/22/2024	*P-171/P-172*	*C.O*	*30*	*29*	*12:53*	*12:58*	*PASS*	*N/A*	*E.O.S*
7/22/2024	*P-172/P-173*	*C.O*	*30*	*30*	*1:32*	*1:37*	*PASS*	*N/A*	*320' to S*
7/22/2024	*P-172/P-173*	*C.O*	*30*	*30*	*2:00*	*2:05*	*PASS*	*N/A*	*320' to E.O.S*

New England Liner Systems, Inc. — *Non Destructive Test Data*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM SEGMENT*	*TESTER INITIALS*	*PRESSURE PSI START*	*END*	*TEST TIME START*	*END*	*PASS FAIL*	*V-BOX PASS*	*COMMENTS*
7/22/2024	*P-173/P-174*	*C.O*	*30*	*29*	*2:25*	*2:30*	*PASS*	*N/A*	*E.O.S*
7/25/2024	*P-167/P-175*	*C.O*	*30*	*29*	*8:41*	*8:46*	*PASS*	*N/A*	*E.O.S*
7/25/2024	*P-165/P-175*	*C.O*	*30*	*29*	*8:47*	*8:52*	*PASS*	*N/A*	*E.O.S*
7/25/2024	*P-168/P-175*	*C.O*	*30*	*30*	*8:53*	*8:58*	*PASS*	*N/A*	*E.O.S*
7/25/2024	*P-168/P-169*	*C.O*	*30*	*30*	*8:59*	*9:04*	*PASS*	*N/A*	*E.O.S*
7/25/2024	*P-168/P-177*	*C.O*	*30*	*29*	*9:11*	*9:16*	*PASS*	*N/A*	*E.O.S*
7/25/2024	*P-168/P-176*	*C.O*	*30*	*30*	*9:17*	*9:22*	*PASS*	*N/A*	*E.O.S*
7/25/2024	*P-176/P-177*	*C.O*	*30*	*30*	*9:23*	*9:28*	*PASS*	*N/A*	*E.O.S*
7/25/2024	*P-169/P-177*	*C.O*	*30*	*29*	*9:05*	*9:10*	*PASS*	*N/A*	*E.O.S*
7/25/2024	*P-169/P-170*	*C.O*	*30*	*30*	*9:47*	*9:52*	*PASS*	*N/A*	*E.O.S*
7/25/2024	*P-169/P-178*	*C.O*	*30*	*29*	*9:35*	*9:40*	*PASS*	*N/A*	*E.O.S*
7/25/2024	*P-177/P-178*	*C.O*	*30*	*29*	*9:29*	*9:34*	*PASS*	*N/A*	*E.O.S*
7/25/2024	*P-170/P-178*	*C.O*	*30*	*29*	*9:41*	*9:46*	*PASS*	*N/A*	*E.O.S*
7/25/2024	*P-170/P-171*	*C.O*	*30*	*30*	*9:53*	*9:58*	*PASS*	*N/A*	*E.O.S*
7/25/2024	*P-170/P-179*	*C.O*	*30*	*29*	*10:05*	*10:10*	*PASS*	*N/A*	*E.O.S*
7/25/2024	*P-178/P-179*	*C.O*	*30*	*30*	*10:11*	*10:16*	*PASS*	*N/A*	*E.O.S*
7/25/2024	*P-171/P-179*	*C.O*	*30*	*29*	*9:59*	*10:04*	*PASS*	*N/A*	*E.O.S*
7/25/2024	*P-171/P-172*	*C.O*	*30*	*30*	*10:35*	*10:40*	*PASS*	*N/A*	*E.O.S*
7/25/2024	*P-171/P-180*	*C.O*	*30*	*29*	*10:23*	*10:28*	*PASS*	*N/A*	*E.O.S*
7/25/2024	*P-179/P-180*	*C.O*	*30*	*30*	*10:17*	*10:22*	*PASS*	*N/A*	*E.O.S*
7/25/2024	*P-172/P-180*	*C.O*	*30*	*29*	*10:29*	*10:34*	*PASS*	*N/A*	*E.O.S*
7/25/2024	*P-172/P-173*	*C.O*	*30*	*30*	*10:42*	*10:47*	*PASS*	*N/A*	*E.O.S*

New England Liner Systems, Inc. — *Non Destructive Test Data*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM SEGMENT*	*TESTER INITIALS*	*PRESSURE PSI START*	*END*	*TEST TIME START*	*END*	*PASS FAIL*	*V-BOX PASS*	*COMMENTS*
7/25/2024	*P-172/P-181*	*C.O*	*30*	*29*	*10:54*	*10:59*	*PASS*	*N/A*	*E.O.S*
7/25/2024	*P-180/P-181*	*C.O*	*30*	*30*	*11:00*	*11:05*	*PASS*	*N/A*	*E.O.S*
7/25/2024	*P-173/P-181*	*C.O*	*30*	*29*	*10:48*	*10:53*	*PASS*	*N/A*	*E.O.S*
7/25/2024	*P-173/P-174*	*C.O*	*30*	*30*	*11:47*	*11:52*	*PASS*	*N/A*	*E.O.S*
7/25/2024	*P-173/P-182*	*C.O*	*30*	*29*	*11:35*	*11:40*	*PASS*	*N/A*	*E.O.S*
7/25/2024	*P-181/P-182*	*C.O*	*30*	*29*	*11:29*	*11:34*	*PASS*	*N/A*	*19' to S*
7/25/2024	*P-181/P-182*	*C.O*	*30*	*29*	*11:22*	*11:27*	*PASS*	*N/A*	*19' to E.O.S*
7/25/2024	*P-181/P-183*	*C.O*	*30*	*29*	*11:09*	*11:14*	*PASS*	*N/A*	*E.O.S*
7/25/2024	*P-174/P-182*	*C.O*	*30*	*29*	*11:41*	*11:46*	*PASS*	*N/A*	*E.O.S*
7/25/2024	*P-182/P-183*	*C.O*	*30*	*29*	*11:15*	*11:20*	*PASS*	*N/A*	*E.O.S*
7/26/2024	*P-174/P-184*	*M.R*	*30*	*29*	*7:13*	*7:18*	*PASS*	*N/A*	*544' to S*
7/26/2024	*P-174/P-184*	*M.R*	*30*	*30*	*7:25*	*7:30*	*PASS*	*N/A*	*544' toE.O.S*
7/26/2024	*P-174/P-185*	*M.R*	*30*	*30*	*7:33*	*7:38*	*PASS*	*N/A*	*E.O.S*
7/26/2024	*P-182/P-185*	*M.R*	*30*	*30*	*7:40*	*7:45*	*PASS*	*N/A*	*E.O.S*
7/26/2024	*P-183/P-185*	*M.R*	*30*	*30*	*7:43*	*7:48*	*PASS*	*N/A*	*E.O.S*
7/26/2024	*P-184/P-185*	*M.R*	*30*	*29*	*7:30*	*7:35*	*PASS*	*N/A*	*E.O.S*
7/26/2024	*P-185/P-186*	*M.R*	*30*	*29*	*7:34*	*7:39*	*PASS*	*N/A*	*E.O.S*
7/26/2024	*P-184/P-186*	*M.R*	*30*	*30*	*7:27*	*7:32*	*PASS*	*N/A*	*E.O.S*
7/26/2024	*P-184/P-187*	*M.R*	*30*	*30*	*7:05*	*7:10*	*PASS*	*N/A*	*108' to S*
7/26/2024	*P-184/P-187*	*M.R*	*30*	*29*	*7:15*	*7:20*	*PASS*	*N/A*	*108' to E.O.S*
7/26/2024	*P-186/P-187*	*M.R*	*30*	*29*	*7:17*	*7:22*	*PASS*	*N/A*	*12' to E*
7/26/2024	*P-186/P-187*	*M.R*	*30*	*29*	*7:18*	*7:23*	*PASS*	*N/A*	*12' to E.O.S*

New England Liner Systems, Inc. — *Non Destructive Test Data*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM SEGMENT*	*TESTER INITIALS*	*PRESSURE PSI START*	*END*	*TEST TIME START*	*END*	*PASS FAIL*	*V-BOX PASS*	*COMMENTS*
7/26/2024	*P-187/P-188*	*M.R*	*30*	*30*	*7:07*	*7:12*	*PASS*	*N/A*	*E.O.S*
7/29/2024	*P-188/P-189*	*C.O*	*30*	*29*	*9:48*	*9:53*	*PASS*	*N/A*	*E.O.S*
7/29/2024	*P-187/P-189*	*C.O*	*30*	*30*	*9:57*	*10:02*	*PASS*	*N/A*	*88' to S*
7/29/2024	*P-187/P-189*	*C.O*	*30*	*29*	*10:03*	*10:08*	*PASS*	*N/A*	*88' to E.O.S*
7/29/2024	*P-186/P-189*	*C.O*	*30*	*30*	*10:09*	*10:14*	*PASS*	*N/A*	*E.O.S*
7/29/2024	*P-189/P-190*	*C.O*	*30*	*30*	*10:20*	*10:25*	*PASS*	*N/A*	*E.O.S*
7/29/2024	*P-190/P-191*	*C.O*	*30*	*29*	*10:26*	*10:31*	*PASS*	*N/A*	*E.O.S*
7/29/2024	*P-189/P-191*	*C.O*	*30*	*29*	*10:32*	*10:37*	*PASS*	*N/A*	*E.O.S*
7/29/2024	*P-188/P-191*	*C.O*	*30*	*29*	*10:44*	*10:49*	*PASS*	*N/A*	*10' to S*
7/29/2024	*P-188/P-191*	*C.O*	*30*	*29*	*10:38*	*10:43*	*PASS*	*N/A*	*10' to E.O.S*
7/29/2024	*P-188/P-192*	*C.O*	*30*	*30*	*10:56*	*11:01*	*PASS*	*N/A*	*E.O.S*
7/29/2024	*P-191/P-192*	*C.O*	*30*	*30*	*10:50*	*10:55*	*PASS*	*N/A*	*E.O.S*
7/29/2024	*P-192/P-194*	*C.O*	*30*	*30*	*11:10*	*11:15*	*PASS*	*N/A*	*E.O.S*
7/29/2024	*P-191/P-194*	*C.O*	*30*	*30*	*11:16*	*11:21*	*PASS*	*N/A*	*E.O.S*
7/29/2024	*P-194/P-193*	*C.O*	*30*	*30*	*11:22*	*11:27*	*PASS*	*N/A*	*E.O.S*
7/29/2024	*P-191/P-193*	*C.O*	*30*	*29*	*11:30*	*11:35*	*PASS*	*N/A*	*E.O.S*
7/30/2024	*P-190/P-193*	*C.O*	*30*	*29*	*7:22*	*7:27*	*PASS*	*N/A*	*E.O.S*
7/30/2024	*P-193/P-195*	*C.O*	*30*	*29*	*7:32*	*7:37*	*PASS*	*N/A*	*396' to N*
7/30/2024	*P-193/P-195*	*C.O*	*30*	*29*	*7:45*	*7:50*	*PASS*	*N/A*	*396' to E.O.S*
7/30/2024	*P-195/P-196*	*C.O*	*30*	*30*	*8:04*	*8:09*	*PASS*	*N/A*	*200' to N*
7/30/2024	*P-195/P-196*	*C.O*	*30*	*29*	*7:55*	*8:00*	*PASS*	*N/A*	*200' to E.O.S*
7/30/2024	*P-196/P-197*	*C.O*	*30*	*30*	*8:29*	*8:34*	*PASS*	*N/A*	*E.O.S*

New England Liner Systems, Inc. — *Non Destructive Test Data*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM SEGMENT*	*TESTER INITIALS*	*PRESSURE PSI START*	*END*	*TEST TIME START*	*END*	*PASS FAIL*	*V-BOX PASS*	*COMMENTS*
7/30/2024	*P-197/P-198*	*C.O*	*30*	*30*	*8:21*	*8:26*	*PASS*	*N/A*	*E.O.S*
7/30/2024	*P-196/P-198*	*C.O*	*30*	*30*	*8:13*	*8:18*	*PASS*	*N/A*	*E.O.S*
7/30/2024	*P-194/P-200*	*C.O*	*30*	*29*	*11:22*	*11:27*	*PASS*	*N/A*	*E.O.S*
7/30/2024	*P-199/P-200*	*C.O*	*30*	*29*	*1:12*	*1:17*	*PASS*	*N/A*	*E.O.S*
7/30/2024	*P-194/P-199*	*C.O*	*30*	*30*	*1:06*	*1:11*	*PASS*	*N/A*	*30' to S*
7/30/2024	*P-194/P-199*	*C.O*	*30*	*30*	*1:00*	*1:05*	*PASS*	*N/A*	*30' to E.O.S*
7/30/2024	*P-193/P-199*	*C.O*	*30*	*29*	*12:53*	*12:58*	*PASS*	*N/A*	*E.O.S*
7/30/2024	*P-196/P-201*	*C.O*	*30*	*29*	*1:35*	*1:40*	*PASS*	*N/A*	*E.O.S*
7/30/2024	*P-201/P-202*	*C.O*	*30*	*29*	*1:33*	*1:38*	*PASS*	*N/A*	*E.O.S*
7/30/2024	*P-200/P-202*	*C.O*	*30*	*30*	*1:28*	*1:33*	*PASS*	*N/A*	*73' to S*
7/30/2024	*P-200/P-202*	*C.O*	*30*	*30*	*2:13*	*2:18*	*PASS*	*N/A*	*73' to E.O.S*
7/30/2024	*P-199/P-202*	*C.O*	*30*	*30*	*2:01*	*2:06*	*PASS*	*N/A*	*E.O.S*
7/30/2024	*P-195/P-202*	*C.O*	*30*	*30*	*1:45*	*1:50*	*PASS*	*N/A*	*E.O.S*
7/30/2024	*P-195/P-199*	*C.O*	*30*	*29*	*1:53*	*1:58*	*PASS*	*N/A*	*E.O.S*
7/30/2024	*P-202/P-203*	*C.O*	*30*	*30*	*3:22*	*3:27*	*PASS*	*N/A*	*305' to S*
7/30/2024	*P-202/P-203*	*C.O*	*30*	*30*	*2:07*	*2:12*	*PASS*	*N/A*	*305' to 403'*
7/30/2024	*P-202/P-203*	*C.O*	*30*	*30*	*1:39*	*1:44*	*PASS*	*N/A*	*403' to E.O.S*
9/17/24.	*P-1/P-204*	*A.C*	*30*	*29*	*10:08*	*10:13*	*PASS*	*N/A*	*E.O.S*
9/17/24.	*P-204/P-205*	*A.C*	*30*	*30*	*10:11*	*10:16*	*PASS*	*N/A*	*E.O.S*
9/17/24.	*P-205/P-206*	*A.C*	*30*	*30*	*10:22*	*10:27*	*PASS*	*N/A*	*155' to S/E*
9/17/24.	*P-205/P-206*	*A.C*	*30*	*30*	*10:17*	*10:22*	*PASS*	*N/A*	*155' to E.O.S*
9/17/24.	*P-206/P-207*	*A.C*	*30*	*29*	*10:29*	*10:34*	*PASS*	*N/A*	*E.O.S*

New England Liner Systems, Inc. — *Non Destructive Test Data*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM SEGMENT*	*TESTER INITIALS*	*PRESSURE PSI START*	*END*	*TEST TIME START*	*END*	*PASS FAIL*	*V-BOX PASS*	*COMMENTS*
9/17/24.	*P-206/P-208*	*A.C*	*30*	*30*	*10:26*	*10:31*	*PASS*	*N/A*	*E.O.S*
9/17/24.	*P-207/P-208*	*A.C*	*30*	*29*	*10:34*	*10:39*	*PASS*	*N/A*	*E.O.S*
9/17/24.	*P-207/P-209*	*A.C*	*30*	*29*	*10:38*	*10:43*	*PASS*	*N/A*	*E.O.S*
9/17/24.	*P-208/P-209*	*A.C*	*30*	*29*	*10:42*	*10:47*	*PASS*	*N/A*	*E.O.S*
9/17/24.	*P-209/P-210*	*A.C*	*30*	*29*	*11:13*	*11:18*	*PASS*	*N/A*	*E.O.S*
9/17/24.	*P-210/P-211*	*A.C*	*30*	*29*	*10:48*	*10:53*	*PASS*	*N/A*	*E.O.S*
9/17/24.	*P-209/P-211*	*A.C*	*30*	*29*	*12:36*	*12:41*	*PASS*	*N/A*	*E.O.S*
9/17/24.	*P-208/P-211*	*A.C*	*30*	*30*	*12:35*	*12:40*	*PASS*	*N/A*	*E.O.S*
9/17/24.	*P-206/P-211*	*A.C*	*30*	*29*	*11:55*	*12:00*	*PASS*	*N/A*	*E.O.S*
9/17/24.	*P-212/P-213*	*A.C*	*30*	*29*	*1:22*	*1:27*	*PASS*	*N/A*	*E.O.S*
9/17/24.	*P-211/P-213*	*A.C*	*30*	*30*	*12:41*	*12:46*	*PASS*	*N/A*	*167' to S*
9/17/24.	*P-211/P-213*	*A.C*	*30*	*30*	*11:47*	*11:52*	*PASS*	*N/A*	*167' to E.O.S*
9/17/24.	*P-211/P-214*	*A.C*	*30*	*30*	*12:50*	*12:55*	*PASS*	*N/A*	*73' to S*
9/17/24.	*P-211/P-214*	*A.C*	*30*	*29*	*12:48*	*12:53*	*PASS*	*N/A*	*73' to E.O.S*
9/17/24.	*P-213/P-214*	*A.C*	*30*	*30*	*1:00*	*1:05*	*PASS*	*N/A*	*9' to E*
9/17/24.	*P-213/P-214*	*A.C*	*30*	*29*	*1:03*	*1:08*	*PASS*	*N/A*	*9' to E.O.S*
9/17/24.	*P-214/P-215*	*A.C*	*30*	*30*	*1:13*	*1:18*	*PASS*	*N/A*	*E.O.S*
9/17/24.	*P-213/P-215*	*A.C*	*30*	*30*	*1:11*	*1:16*	*PASS*	*N/A*	*51' to S*
9/17/24.	*P-213/P-215*	*A.C*	*30*	*30*	*1:58*	*2:03*	*PASS*	*N/A*	*51' to 350'*
9/17/24.	*P-213/P-215*	*A.C*	*30*	*30*	*1:52*	*1:57*	*PASS*	*N/A*	*350' to E.O.S*
9/17/24.	*P-203/P-211*	*A.C*	*30*	*29*	*11:00*	*11:05*	*PASS*	*N/A*	*7' to S*
9/17/24.	*P-203/P-211*	*A.C*	*30*	*30*	*11:06*	*11:11*	*PASS*	*N/A*	*7' to 133'*

New England Liner Systems, Inc. — *Non Destructive Test Data*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM SEGMENT*	*TESTER INITIALS*	*PRESSURE PSI START*	*END*	*TEST TIME START*	*END*	*PASS FAIL*	*V-BOX PASS*	*COMMENTS*
9/17/24.	*P-203/P-211*	*A.C*	*30*	*29*	*11:28*	*11:33*	*PASS*	*N/A*	*133' to 152'*
9/17/24.	*P-203/P-211*	*A.C*	*30*	*29*	*11:32*	*11:37*	*PASS*	*N/A*	*152' to 163'*
9/17/24.	*P-203/P-211*	*A.C*	*30*	*29*	*11:35*	*11:40*	*PASS*	*N/A*	*163' to 175' CAP*
9/17/24.	*P-211/P-212*	*A.C*	*30*	*29*	*11:43*	*11:48*	*PASS*	*N/A*	*E.O.S*
9/17/24.	*P-203/P-212*	*A.C*	*30*	*29*	*1:25*	*1:30*	*PASS*	*N/A*	*48' to S*
9/17/24.	*P-203/P-212*	*A.C*	*30*	*29*	*1:32*	*1:37*	*PASS*	*N/A*	*48' to 207'*
9/17/24.	*P-203/P-212*	*A.C*	*30*	*29*	*1:34*	*1:39*	*PASS*	*N/A*	*207' to 229'*
9/17/24.	*P-203/P-212*	*A.C*	*30*	*30*	*1:42*	*1:47*	*PASS*	*N/A*	*229' to E.O.S*
9/17/24.	*P-209/P-220*	*A.C*	*30*	*30*	*11:18*	*11:23*	*PASS*	*N/A*	*E.O.S*
9/17/24.	*P-210/P-220*	*A.C*	*30*	*29*	*10:49*	*10:54*	*PASS*	*N/A*	*E.O.S*
9/17/24.	*P-215/P-216*	*A.C*	*30*	*30*	*2:08*	*2:13*	*PASS*	*N/A*	*E.O.S*
9/17/24.	*P-216/P-218*	*A.C*	*30*	*29*	*3:26*	*3:31*	*PASS*	*N/A*	*34' to S*
9/17/24.	*P-216/P-218*	*A.C*	*30*	*29*	*3:24*	*3:29*	*PASS*	*N/A*	*34' to 157'*
9/17/24.	*P-216/P-218*	*A.C*	*30*	*29*	*3:17*	*3:22*	*PASS*	*N/A*	*157' to 236'*
9/17/24.	*P-216/P-218*	*A.C*	*30*	*29*	*3:15*	*3:20*	*PASS*	*N/A*	*236' to 231'*
9/17/24.	*P-216/P-218*	*A.C*	*30*	*29*	*3:06*	*3:11*	*PASS*	*N/A*	*321' to E.O.S*
9/17/24.	*P-216/P-217*	*A.C*	*30*	*29*	*3:03*	*3:08*	*PASS*	*N/A*	*E.O.S*
9/17/24.	*P-217/P-219*	*A.C*	*30*	*30*	*2:30*	*2:35*	*PASS*	*N/A*	*E.O.S*
9/17/24.	*P-217/P-218*	*A.C*	*30*	*29*	*1:21*	*1:26*	*PASS*	*N/A*	*E.O.S*
9/17/24.	*P-218/P-219*	*A.C*	*30*	*29*	*2:19*	*2:24*	*PASS*	*N/A*	*E.O.S*
9/17/24.	*P-218/P-221*	*A.C*	*30*	*29*	*5:28*	*5:33*	*PASS*	*N/A*	*41' to N*
9/17/24.	*P-218/P-221*	*A.C*	*30*	*30*	*5:25*	*5:30*	*PASS*	*N/A*	*41' to E.O.S*

New England Liner Systems, Inc. — *Non Destructive Test Data*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM SEGMENT*	*TESTER INITIALS*	*PRESSURE PSI START*	*END*	*TEST TIME START*	*END*	*PASS FAIL*	*V-BOX PASS*	*COMMENTS*
9/17/24.	*P-221/P-223*	*A.C*	*30*	*29*	*5:57*	*6:02*	*PASS*	*N/A*	*E.O.S*
9/17/24.	*P-222/P-223*	*A.C*	*30*	*30*	*5:59*	*6:04*	*PASS*	*N/A*	*E.O.S*
9/17/24.	*P-221/P-222*	*A.C*	*30*	*30*	*6:04*	*6:09*	*PASS*	*N/A*	*E.O.S*
9/17/24.	*P-219/P-221*	*A.C*	*30*	*29*	*5:47*	*5:52*	*PASS*	*N/A*	*7' to E*
9/17/24.	*P-219/P-221*	*A.C*	*30*	*29*	*5:44*	*5:49*	*PASS*	*N/A*	*7' to E.O.S*
9/17/24.	*P-219/P-222*	*A.C*	*30*	*30*	*3:38*	*3:43*	*PASS*	*N/A*	*165' to N*
9/17/24.	*P-219/P-222*	*A.C*	*30*	*30*	*3:37*	*3:42*	*PASS*	*N/A*	*165' to E.O.S*
9/17/24.	*P-222/P-225*	*A.C*	*30*	*30*	*6:08*	*6:13*	*PASS*	*N/A*	*E.O.S*
9/17/24.	*P-222/P-224*	*A.C*	*30*	*30*	*6:30*	*6:35*	*PASS*	*N/A*	*E.O.S*
9/17/24.	*P-224/P-225*	*A.C*	*30*	*29*	*6:12*	*6:17*	*PASS*	*N/A*	*E.O.S*
10/8/2024	*P-226/P-228*	*JK*	*30*	*30*	*9:48*	*9:53*	*PASS*	*N/A*	*E.O.S*
10/8/2024	*P-226/P-227*	*JK*	*30*	*30*	*9:45*	*9:50*	*PASS*	*N/A*	*E.O.S*
10/8/2024	*P-227/P-228*	*JK*	*30*	*30*	*9:47*	*9:52*	*PASS*	*N/A*	*E.O.S*
10/8/2024	*P-228/P-229*	*JK*	*30*	*30*	*10:05*	*10:10*	*PASS*	*N/A*	*E.O.S*
10/8/2024	*P-229/P-230*	*JK*	*30*	*30*	*10:07*	*10:12*	*PASS*	*N/A*	*E.O.S*
10/8/2024	*P-230/P-231*	*JK*	*30*	*30*	*10:10*	*10:15*	*PASS*	*N/A*	*E.O.S*
10/8/2024	*P-231/P-232*	*JK*	*30*	*30*	*10:19*	*10:24*	*PASS*	*N/A*	*E.O.S*
10/8/2024	*P-232/P-233*	*JK*	*30*	*30*	*10:20*	*10:25*	*PASS*	*N/A*	*E.O.S*
10/8/2024	*P-233/P-235*	*JK*	*30*	*30*	*10:27*	*10:32*	*PASS*	*N/A*	*E.O.S*
10/8/2024	*P-233/P-234*	*JK*	*30*	*30*	*10:36*	*10:41*	*PASS*	*N/A*	*E.O.S*
10/8/2024	*P-235/P-236*	*JK*	*30*	*30*	*10:29*	*10:34*	*PASS*	*N/A*	*E.O.S*
10/8/2024	*P-235/P-234*	*JK*	*30*	*30*	*10:37*	*10:42*	*PASS*	*N/A*	*E.O.S*

New England Liner Systems, Inc. — *Non Destructive Test Data*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM SEGMENT*	*TESTER INITIALS*	*PRESSURE PSI START*	*END*	*TEST TIME START*	*END*	*PASS FAIL*	*V-BOX PASS*	*COMMENTS*
10/8/2024	*P-234/P-236*	*JK*	*30*	*30*	*10:42*	*10:47*	*PASS*	*N/A*	*E.O.S*
10/8/2024	*P-236/P-237*	*JK*	*30*	*30*	*10:45*	*10:50*	*PASS*	*N/A*	*E.O.S*
10/8/2024	*P-237/P-238*	*JK*	*30*	*30*	*10:50*	*10:55*	*PASS*	*N/A*	*E.O.S*
10/8/2024	*P-238/P-239*	*JK*	*30*	*30*	*10:52*	*10:57*	*PASS*	*N/A*	*E.O.S*
10/8/2024	*P-239/P-240*	*JK*	*30*	*30*	*11:20*	*11:25*	*PASS*	*N/A*	*E.O.S*
10/8/2024	*P-239/P-241*	*JK*	*30*	*30*	*10:56*	*11:01*	*PASS*	*N/A*	*E.O.S*
10/8/2024	*P-240/P-241*	*JK*	*30*	*30*	*10:57*	*11:02*	*PASS*	*N/A*	*E.O.S*
10/8/2024	*P-240/P-242*	*JK*	*30*	*30*	*11:05*	*11:10*	*PASS*	*N/A*	*E.O.S*
10/8/2024	*P-241/P-242*	*JK*	*30*	*30*	*11:07*	*11:12*	*PASS*	*N/A*	*E.O.S*
10/8/2024	*P-242/P-243*	*JK*	*30*	*30*	*11:09*	*11:14*	*PASS*	*N/A*	*E.O.S*
10/8/2024	*P-243/P-244*	*JK*	*30*	*30*	*11:16*	*11:21*	*PASS*	*N/A*	*E.O.S*
10/8/2024	*P-244/P-245*	*JK*	*30*	*30*	*11:20*	*11:25*	*PASS*	*N/A*	*E.O.S*
10/8/2024	*P-245/P-246*	*JK*	*30*	*30*	*11:31*	*11:36*	*PASS*	*N/A*	*E.O.S*
10/8/2024	*P-246/P-247*	*JK*	*30*	*30*	*11:42*	*11:47*	*PASS*	*N/A*	*E.O.S*
10/8/2024	*P-228/EXL*	*JK*	*30*	*30*	*12:48*	*12:53*	*PASS*	*N/A*	*E.O.S TIE IN*
10/8/2024	*P-229/EXL*	*JK*	*30*	*30*	*12:40*	*12:45*	*PASS*	*N/A*	*E.O.S TIE IN*
10/8/2024	*P-230/EXL*	*JK*	*30*	*30*	*12:34*	*12:39*	*PASS*	*N/A*	*E.O.S TIE IN*
10/8/2024	*P-231/EXL*	*JK*	*30*	*30*	*12:27*	*12:32*	*PASS*	*N/A*	*E.O.S TIE IN*
10/8/2024	*P-232/EXL*	*JK*	*30*	*30*	*12:25*	*12:30*	*PASS*	*N/A*	*E.O.S TIE IN*
10/8/2024	*P-233/EXL*	*JK*	*30*	*30*	*12:24*	*12:29*	*PASS*	*N/A*	*E.O.S TIE IN*
10/8/2024	*P-235/EXL*	*JK*	*30*	*30*	*12:22*	*12:27*	*PASS*	*N/A*	*E.O.S TIE IN*
10/8/2024	*P-236/EXL*	*JK*	*30*	*30*	*12:21*	*12:26*	*PASS*	*N/A*	*E.O.S TIE IN*

New England Liner Systems, Inc. — *Non Destructive Test Data*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SEAM SEGMENT*	*TESTER INITIALS*	*PRESSURE PSI START*	*PRESSURE PSI END*	*TEST TIME START*	*TEST TIME END*	*PASS FAIL*	*V-BOX PASS*	*COMMENTS*
10/8/2024	*P-237/EXL*	*JK*	*30*	*30*	*12:19*	*12:24*	*PASS*	*N/A*	*E.O.S TIE IN*
10/8/2024	*P-238/EXL*	*JK*	*30*	*30*	*12:10*	*12:15*	*PASS*	*N/A*	*E.O.S TIE IN*
10/8/2024	*P-239/EXL*	*JK*	*30*	*30*	*12:13*	*12:18*	*PASS*	*N/A*	*E.O.S TIE IN*
10/8/2024	*P-240/EXL*	*JK*	*30*	*30*	*12:06*	*12:11*	*PASS*	*N/A*	*E.O.S TIE IN*
10/8/2024	*P-242/EXL*	*JK*	*30*	*30*	*12:04*	*12:09*	*PASS*	*N/A*	*E.O.S TIE IN*
10/8/2024	*P-242/EXL*	*JK*	*30*	*30*	*12:02*	*12:07*	*PASS*	*N/A*	*E.O.S TIE IN*
10/8/2024	*P-243/EXL*	*JK*	*30*	*30*	*12:01*	*12:06*	*PASS*	*N/A*	*E.O.S TIE IN*
10/8/2024	*P-244/EXL*	*JK*	*30*	*30*	*11:59*	*12:04*	*PASS*	*N/A*	*E.O.S TIE IN*
10/8/2024	*P-245/EXL*	*JK*	*30*	*30*	*11:57*	*12:02*	*PASS*	*N/A*	*E.O.S TIE IN*
10/8/2024	*P-246/EXL*	*JK*	*30*	*30*	*11:56*	*12:01*	*PASS*	*N/A*	*E.O.S TIE IN*
10/8/2024	*P-247/EXL*	*JK*	*30*	*30*	*11:54*	*11:59*	*PASS*	*N/A*	*E.O.S TIE IN*

Appendix G-7 Destructive Test Logs

New England Liner Systems, Inc. *Destructive Test Log*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	SAMPLE ID #	SEAM NUMBER	MACHINE NUMBER	SEAMER INITIALS	TEST MODE	TEST RESULTS IN LBS / IN SAMPLE NUMBER 1	2	3	4	PASS FAIL
6/12/2024					PEEL	67/79	83/84	74/84	87/85	
	DT-1	P-6/P-7	86	O.D	SHEAR	90	92	96	N/A	PASS
6/12/2024					PEEL	80/81	82/85	80/83	89/87	
	DT-2	P-7/P-9	717	C.O	SHEAR	93	92	95	N/A	PASS
6/12/2024					PEEL	79/85	80/87	82/79	89/82	
	DT-3	P-10/P-11	717	C.O	SHEAR	85	88	88	N/A	PASS
6/12/2024					PEEL	81/87	81/77	85/76	80/78	
	DT-4	P-11/P-13	86	O.D	SHEAR	105	95	88	N/A	PASS
6/12/2024					PEEL	77/79	83/75	80/71	79/70	
	DT-5	P-15/P-17	717	C.O	SHEAR	84	90	89	N/A	PASS
6/12/2024					PEEL	80/79	85/85	78/83	82/84	
	DT-6	P-17/P-18	86	O.D	SHEAR	85	90	92	N/A	PASS
6/12/2024					PEEL	85/79	82/87	86/76	80/84	
	DT-7	P-18/P-20	86	O.D	SHEAR	96	90	87	N/A	PASS
6/12/2024					PEEL	64/76	66/82	78/65	91/69	
	DT-8	P-19/P-21	717	C.O	SHEAR	86	89	93	N/A	PASS
6/12/2024					PEEL	75/68	83/85	77/71	76/86	
	DT-9	P-21/P-22	86	O.D	SHEAR	90	86	90	N/A	PASS
6/13/24					PEEL	77/75	79/74	80/72	74/71	
	DT-10	P-30/P-32	717	C.O	SHEAR	86	89	96	N/A	PASS
6/13/24					PEEL	71/73	70/79	78/69	79/72	
	DT-11	P-32/P-33	86	O.D	SHEAR	80	79	83	N/A	PASS
6/13/24					PEEL	90/87	87/75	83/78	80/78	
	DT-12	P-36/P-38	717	C.O	SHEAR	86	89	87	N/A	PASS
6/13/24					PEEL	71/80	74/82	85/80	85/81	
	DT-13	P-38/P-39	86	O.D	SHEAR	83	85	82	N/A	PASS
6/13/24					PEEL	92/79	74/85	84/79	88/84	
	DT-14	P-42/P-43	717	C.O	SHEAR	91	96	95	N/A	PASS
6/13/24					PEEL	85/79	87/89	84/79	87/90	
	DT-15	P-43/P-44	86	O.D	SHEAR	88	90	93	N/A	PASS
6/13/24					PEEL	84/83	83/85	83/83	83/79	
	DT-16	P-49/P-50	717	C.O	SHEAR	91	92	94	N/A	PASS
6/13/24					PEEL	83/85	85/87	84/71	83/79	
	DT-17	P-51/P-53	86	O.D	SHEAR	93	92	90	N/A	PASS
6/13/24					PEEL	75/71	73/71	81/83	82/81	
	DT-18	P-52/P-53	717	C.O	SHEAR	80	82	83	N/A	PASS
6/14/2024					PEEL	79/91	82/93	81/91	88/86	
	DT-19	P-56/P-57	86	O.D	SHEAR	104	101	106	N/A	PASS
6/14/2024					PEEL	86/94	89/94	90/90	89/93	
	DT-20	P-59/P-60	717	C.O	SHEAR	96	96	96	N/A	PASS
6/14/2024					PEEL	95/78	95/78	92/76	96/78	
	DT-21	P-63/P-64	86	O.D	SHEAR	99	99	95	N/A	PASS
6/14/2024					PEEL	86/81	91/86	89/76	88/63	
	DT-22	P-64/P-65	717	C.O	SHEAR	97	100	99	N/A	PASS

New England Liner Systems, Inc. *Destructive Test Log*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SAMPLE ID #*	*SEAM NUMBER*	*MACHINE NUMBER*	*SEAMER INITIALS*	*TEST MODE*	*TEST RESULTS IN LBS / IN*				*PASS FAIL*
						SAMPLE NUMBER				
						1	*2*	*3*	*4*	
6/14/2024					PEEL	76/76	78/94	83/79	80/77	
	DT-23	P-65/P-67	86	O.D	SHEAR	97	94	97	N/A	PASS
6/14/2024					PEEL	87/81	82/80	81/86	85/89	
	DT-24	P-68/P-69	717	C.O	SHEAR	93	92	97	N/A	PASS
6/21/2024					PEEL	80/77	85/82	84/77	82/79	
	DT-25	P-74/P-76	86	O.D	SHEAR	86	87	84	N/A	PASS
6/21/2024					PEEL	77/73	74/80	75/77	81/83	
	DT-26	P-76/P-77	717	C.O	SHEAR	95	90	91	N/A	PASS
6/21/2024					PEEL	83/79	80/85	79/83	82/87	
	DT-27	P-79/P-81	86	O.D	SHEAR	102	90	98	N/A	PASS
6/21/2024					PEEL	81/87	84/91	84/87	84/90	
	DT-28	P-81/P-82	717	C.O	SHEAR	102	98	99	N/A	PASS
6/21/2024					PEEL	76/72	77/79	77/76	82/82	
	DT-29	P-88/P-89	717	C.O	SHEAR	94	89	90	N/A	PASS
6/21/2024					PEEL	81/83	88/92	82/87	83/87	
	DT-30	P-89/P-91	86	O.D	SHEAR	90	94	94	N/A	PASS
6/21/2024					PEEL	72/70	78/73	74/70	76/72	
	DT-31	P-91/P-92	717	C.O	SHEAR	90	93	90	N/A	PASS
6/21/2024					PEEL	77/87	77/83	80/72	82/87	
	DT-32	P-92/P-93	86	O.D	SHEAR	87	89	86	N/A	PASS
6/21/2024					PEEL	76/82	80/84	81/81	84/84	
	DT-33	P-102/P-103	717	C.O	SHEAR	98	91	92	N/A	PASS
6/21/2024					PEEL	78/78	83/88	81/82	68/68	
	DT-34	P-103/P-104	86	O.D	SHEAR	90	93	96	N/A	PASS
6/21/2024					PEEL	78/80	82/84	82/76	82/80	
	DT-35	P-105/P-107	717	C.O	SHEAR	83	84	94	N/A	PASS
6/21/2024					PEEL	79/76	83/83	82/82	83/87	
	DT-36	P-107/P-108	86	O.D	SHEAR	90	90	96	N/A	PASS
6/26/2024					PEEL	70/71	73/71	68/68	70/69	
	DT-37	P-113/P-114	86	O.D	SHEAR	79	78	80	N/A	PASS
6/26/2024					PEEL	73/71	72/70	74/70	75/76	
	DT-38	P-114/P-116	717	C.O	SHEAR	81	90	85	N/A	PASS
6/26/2024					PEEL	65/70	71/74	70/69	75/71	
	DT-39	P-123/P-124	86	O.D	SHEAR	72	76	78	N/A	PASS
6/26/2024					PEEL	73/73	73/74	72/76	72/78	
	DT-40	P-122/P-125	717	C.O	SHEAR	80	82	85	N/A	PASS
6/26/2024					PEEL	73/72	74/73	75/74	76/77	
	DT-41	P-127/P-129	717	C.O	SHEAR	80	82	85	N/A	PASS
6/26/2024					PEEL	74/74	77/79	70/70	70/72	
	DT-42	P-131/P-132	86	O.D	SHEAR	80	83	80	N/A	PASS
6/28/2024					PEEL	75/83	87/87	87/85	89/91	
	DT-43	P-132/P-133	717	C.O	SHEAR	97	98	95	N/A	PASS
6/28/2024					PEEL	78/81	79/85	82/83	85/85	
	DT-44	P-136/P-137	717	C.O	SHEAR	96	96	97	N/A	PASS

New England Liner Systems, Inc. *Destructive Test Log*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SAMPLE ID #*	*SEAM NUMBER*	*MACHINE NUMBER*	*SEAMER INITIALS*	*TEST MODE*	*TEST RESULTS IN LBS / IN SAMPLE NUMBER* 1	2	3	4	*PASS FAIL*
6/28/2024					PEEL	78/74	75/80	75/76	79/80	
	DT-45	P-137/P-138	86	O.D	SHEAR	95	96	95	N/A	PASS
6/28/2024					PEEL	69/77	75/83	80/78	73/83	
	DT-46	P-141/P-143	717	C.O	SHEAR	92	91	100	N/A	PASS
6/28/2024					PEEL	82/76	87/78	79/78	80/80	
	DT-47	P-142/P-144	86	O.D	SHEAR	89	90	90	N/A	PASS
6/28/2024					PEEL	72/81	75/84	69/82	73/70	
	DT-48	P-145/P-147	86	O.D	SHEAR	86	89	92	N/A	PASS
6/28/2024					PEEL	76/83	84/82	74/70	71/77	
	DT-49	P-146/P-147	717	C.O	SHEAR	79	83	86	N/A	PASS
6/28/2024					PEEL	74/72	71/75	67/75	72/75	
	DT-50	P-149/P-151	717	C.O	SHEAR	74	86	80	N/A	PASS
6/28/2024					PEEL	70/71	77/79	79/72	88/78	
	DT-51	P-153/P-155	86	C.O	SHEAR	94	82	78	N/A	PASS
6/28/2024					PEEL	77/77	80/81	73/77	70/80	
	DT-52	P-157/P-158	717	C.O	SHEAR	84	89	81	N/A	PASS
6/28/2024					PEEL	78/73	81/74	77/75	75/82	
	DT-53	P-159/P-160	86	O.D	SHEAR	83	85	82	N/A	PASS
7/19/2024					PEEL	80	84	85	87	
	DT-54	P-59/P-163	616	C.O	SHEAR	99	96	100	N/A	PASS
7/19/2024					PEEL	81/85	87/86	84/84	81/89	
	DT-55	P-164/P-165	717	C.O	SHEAR	89	94	90	N/A	PASS
7/19/2024					PEEL	88/82	90/87	88/84	95/95	
	DT-56	P-163/P-166	86	O.D	SHEAR	100	101	97	N/A	PASS
7/19/2024					PEEL	91/93	90/94	88/87	89/90	
	DT-57	P-166/P-167	717	C.O	SHEAR	98	99	100	N/A	PASS
7/22/2024					PEEL	73/75	77/78	72/72	74/74	
	DT-58	P-167/P-168	717	C.O	SHEAR	89	88	88	N/A	PASS
7/22/2024					PEEL	75/75	75/78	80/77	79/82	
	DT-59	P-168/P-169	86	O.D	SHEAR	99	99	101	N/A	PASS
7/22/2024					PEEL	75/70	75/74	76/78	77/82	
	DT-60	P-169/P-170	717	C.O	SHEAR	88	97	99	N/A	PASS
7/22/2024					PEEL	76/77	73/93	77/79	81/80	
	DT-61	P-170/P-171	86	O.D	SHEAR	100	99	96	N/A	PASS
7/22/2024					PEEL	86/75	84/78	76/79	80/76	
	DT-62	P-171/P-172	717	C.O	SHEAR	97	101	99	N/A	PASS
7/22/2024					PEEL	76/78	73/76	77/76	79/80	
	DT-63	P-172/P-173	86	O.D	SHEAR	99	96	93	N/A	PASS
7/22/2024					PEEL	74/77	74/76	73/79	74/79	
	DT-64	P-172/P-173	86	O.D	SHEAR	96	99	99	N/A	PASS
7/22/2024					PEEL	74/75	75/78	78/77	79/81	
	DT-65	P-173/P-174	717	C.O	SHEAR	100	97	99	N/A	PASS
7/22/2024					PEEL	82/76	79/70	72/78	74/77	
	DT-66	P-173/P-174	717	C.O	SHEAR	98	96	99	N/A	PASS

New England Liner Systems, Inc. *Destructive Test Log*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SAMPLE ID #*	*SEAM NUMBER*	*MACHINE NUMBER*	*SEAMER INITIALS*	*TEST MODE*	*TEST RESULTS IN LBS / IN SAMPLE NUMBER* 1	2	3	4	*PASS FAIL*
7/26/2024					PEEL	70/70	71/79	70/78	70/80	
	DT-67	P-178/P-179	86	O.D	SHEAR	98	95	96	N/A	PASS
7/26/2024					PEEL	78/78	79/83	77/76	78/79	
	DT-68	P-172/P-173	717	C.O	SHEAR	93	95	99	N/A	PASS
7/26/2024					PEEL	76/76	81/79	75/77	81/77	
	DT-69	P-181/P-182	86	O.D	SHEAR	93	95	97	N/A	PASS
7/26/2024					PEEL	75/73	79/89	76/79	79/81	
	DT-70	P-174/P-184	717	C.O	SHEAR	94	95	90	N/A	PASS
7/26/2024					PEEL	74/75	80/80	70/81	76/82	
	DT-71	P-182/P-185	717	C.O	SHEAR	90	96	93	N/A	PASS
7/26/2024					PEEL	77/80	77/83	78/75	80/82	
	DT-72	P-184/P-187	86	O.D	SHEAR	90	95	99	N/A	PASS
7/26/2024					PEEL	80/74	80/80	76/76	79/78	
	DT-73	P-185/P-186	86	O.D	SHEAR	88	89	93	N/A	PASS
7/26/2024					PEEL	80/76	77/75	81/80	78/80	
	DT-74	P-186/P-187	717	C.O	SHEAR	92	90	90	N/A	PASS
7/26/2024					PEEL	79	83	82	80	
	DT-75	P-79/P-176	613	F.R	SHEAR	88	89	87	N/A	PASS
7/26/2024					PEEL	80	86	81	80	
	DT-76	P-7/P-187	616	C.O	SHEAR	87	90	86	N/A	PASS
7/30/2024					PEEL	70/70	79/76	70/71	72/73	
	DT-77	P-186/P-189	717	C.O	SHEAR	76	78	86	N/A	PASS
7/30/2024					PEEL	81/73	75/93	70/87	78/98	
	DT-78	P-189/P-191	39	O.D	SHEAR	101	85	87	N/A	PASS
7/30/2024					PEEL	68/73	87/77	69/76	70/76	
	DT-79	P-191/P-193	717	C.O	SHEAR	85	77	85	N/A	PASS
7/30/2024					PEEL	92/70	86/70	86/83	88/74	
	DT-80	P-191/P-193	717	C.O	SHEAR	82	89	88	N/A	PASS
7/30/2024					PEEL	70/77	74/79	75/73	75/74	
	DT-81	P-193/P-195	39	O.D	SHEAR	83	86	85	N/A	PASS
7/30/2024					PEEL	70/79	71/79	69/77	71/81	
	DT-82	P-195/P-196	39	O.D	SHEAR	90	93	92	N/A	PASS
7/30/2024					PEEL	70/72	85/74	70/77	72/77	
	DT-83	P-195/P-196	39	O.D	SHEAR	89	93	85	N/A	PASS
7/30/2024					PEEL	71/73	72/74	70/73	72/76	
	DT-84	P-197/P-198	717	C.O	SHEAR	87	86	82	N/A	PASS
7/30/2024					PEEL	75/70	76/71	73/71	72/73	
	DT-85	P-193/P-199	39	O.D	SHEAR	83	87	87	N/A	PASS
7/30/2024					PEEL	82/78	86/80	82/81	84/82	
	DT-86	P-199/P-202	717	C.O	SHEAR	86	90	91	N/A	PASS
7/30/2024					PEEL	70/74	73/75	79/74	79/74	
	DT-87	P-202/P-203	39	O.D	SHEAR	88	89	88	N/A	PASS
7/30/2024					PEEL	72	80	73	75	
	DT-88	P-114/P-193	616	C.O	SHEAR	85	90	87	N/A	PASS

New England Liner Systems, Inc. *Destructive Test Log*

PROJECT: *Ledge Road Landfill*
2024 Closure
Andover, MA

PRODUCT: *40 Mill LLDPE*

DATE	*SAMPLE ID #*	*SEAM NUMBER*	*MACHINE NUMBER*	*SEAMER INITIALS*	*TEST MODE*	*TEST RESULTS IN LBS / IN*				*PASS FAIL*
						SAMPLE NUMBER				
						1	*2*	*3*	*4*	
7/30/2024					*PEEL*	*74*	*82*	*74*	*77*	
	DT-89	*Existing/P-203*	*613*	*F.R*	*SHEAR*	*78*	*78*	*77*	*N/A*	*PASS*
9/17/2024					*PEEL*	*83/82*	*84/82*	*77/73*	*83/82*	
	DT-90	*P-206/P-208*	*39*	*F.R*	*SHEAR*	*94*	*98*	*95*	*N/A*	*PASS*
9/17/2024					*PEEL*	*79/77*	*80/86*	*87/77*	*91/80*	
	DT-91	*P-203/P-212*	*717*	*C.O*	*SHEAR*	*104*	*109*	*103*	*N/A*	*PASS*
9/17/2024					*PEEL*	*83/89*	*93/103*	*86/83*	*84/81*	
	DT-92	*P-211/P-213*	*717*	*C.O*	*SHEAR*	*93*	*84*	*95*	*N/A*	*PASS*
9/17/2024					*PEEL*	*96/82*	*85/86*	*75/78*	*83/82*	
	DT-93	*P-214/P-215*	*39*	*F.R*	*SHEAR*	*89*	*89*	*90*	*N/A*	*PASS*
9/17/2024					*PEEL*	*79/80*	*86/82*	*71/92*	*76/94*	
	DT-94	*P-213/P-215*	*39*	*F.R*	*SHEAR*	*103*	*92*	*95*	*N/A*	*PASS*
9/17/2024					*PEEL*	*79/79*	*83/79*	*79/88*	*88/98*	
	DT-95	*P-215/P-216*	*717*	*C.O*	*SHEAR*	*91*	*79*	*88*	*N/A*	*PASS*
9/17/2024					*PEEL*	*81/77*	*83/100*	*82/83*	*86/84*	
	DT-96	*P-215/P-216*	*717*	*C.O*	*SHEAR*	*88*	*107*	*90*	*N/A*	*PASS*
9/17/2024					*PEEL*	*78/87*	*85/89*	*80/88*	*81/82*	
	DT-97	*P-216/P-218*	*39*	*F.R*	*SHEAR*	*101*	*99*	*100*	*N/A*	*PASS*
9/17/2024					*PEEL*	*79/80*	*86/90*	*88/77*	*85/83*	
	DT-98	*P-219/P-222*	*717*	*C.O*	*SHEAR*	*90*	*92*	*95*	*N/A*	*PASS*
9/17/2024					*PEEL*	*70/82*	*76/87*	*89/91*	*85/89*	
	DT-99	*P-218/P-221*	*717*	*C.O*	*SHEAR*	*78*	*93*	*95*	*N/A*	*PASS*
9/17/2024					*PEEL*	*75/88*	*78/87*	*77/85*	*71/76*	
	DT-100	*P-222/P-225*	*39*	*F.R*	*SHEAR*	*90*	*90*	*95*	*N/A*	*PASS*
9/17/2024					*PEEL*	*81/74*	*78/70*	*74/98*	*75/91*	
	DT-101	*P-224/P-225*	*717*	*C.O*	*SHEAR*	*106*	*105*	*103*	*N/A*	*PASS*
					PEEL	*80/81*	*78/80*	*82/80*	*81/81*	
10/8/2024	*DT-102*	*P-232/P-233*	*239*	*C.M*	*SHEAR*	*97*	*95*	*96*	*N/A*	*PASS*
					PEEL	*86/93*	*83/77*	*84/78*	*83/85*	
10/8/2024	*DT-103*	*P-238/P-239*	*123*	*P.O*	*SHEAR*	*97*	*100*	*97*	*N/A*	*PASS*
					PEEL	*83/83*	*83/86*	*83/85*	*87/81*	
10/8/2024	*DT-104*	*P-242/P-243*	*123*	*P.O*	*SHEAR*	*92*	*98*	*96*	*N/A*	*PASS*
					PEEL	*83/79*	*82/82*	*85/85*	*90/80*	
10/8/2024	*DT-105*	*P-236/P-237*	*123*	*P.O*	*SHEAR*	*95*	*94*	*97*	*N/A*	*PASS*
					PEEL	*82/83*	*87/77*	*83/79*	*82/79*	
10/8/2024	*DT-106*	*P-230/P-231*	*239*	*C.M*	*SHEAR*	*104*	*103*	*103*	*N/A*	*PASS*

Appendix H GCL Test Results

Appendix H-1 Certificates of Analysis

GCL Quality Certification

Customer: New England Liner Systems
Project: Ledge Road LF Closure Project
Destination: Andover, MA
Report Date: 28-Apr-2024 9:15 PM

S.O.# SO00021821
Item Number: FM-GCL-WN33-7-01S
GCL Type: Geoclay 0.75LB 1.0PEEL 3oz Woven Bottom 3oz Nonwoven Top (Standard Clay)
Roll Count: 51 (From 1 To 51)

										ASTM D6768	ASTM D6496	ASTM D5993		ASTM D5891	ASTM D5890	ASTM D5887	
#	Roll Number	Production Date	Width (ft)	Length (ft)	Area (sqft)	Weight	CAP Roll #	BASE Roll #	Bentonite Lot	Tensile Strength	Peel Strength	Bentonite Mass	Moisture Content	Fluid Loss	Swell Index	Index Flux	Hydraulic Conductivity
										ppi	ppi	lb/ft2	%	ml	ml/2 g	m3/m2/s	cm/s
1	GTG0135040001	04/12/24	15.5	150	2325	2388	ATNL10117610060	PW29100139	909139824	51	3	0.981	6.9	13	33	4.1E-9	2.0E-9
2	GTG0135040002	04/12/24	15.5	150	2325	2447	ATNL10117610060	PW29100139	909139824	51	3	0.981	6.9	13	33	4.1E-9	2.0E-9
3	GTG0135040004	04/12/24	15.5	150	2325	2564	ATNL10117610060	PW29100139	909139824	51	3	0.981	6.9	13	33	4.1E-9	2.0E-9
4	GTG0135040005	04/12/24	15.5	150	2325	2504	ATNL10117610060	PW29100139	909139824	51	3	0.981	6.9	13	33	4.1E-9	2.0E-9
5	GTG0135040006	04/12/24	15.5	150	2325	2527	ATNL10117610060	PW29100139	909139824	51	3	0.981	6.9	13	33	4.1E-9	2.0E-9
6	GTG0135040007	04/12/24	15.5	150	2325	2546	ATNL10117610060	PW29100139	909139824	51	3	0.981	6.9	13	33	4.1E-9	2.0E-9
7	GTG0135040008	04/12/24	15.5	150	2325	2549	ATNL10118440004	PW29100139	909139824	51	3	0.981	6.9	13	33	4.1E-9	2.0E-9
8	GTG0135040009	04/12/24	15.5	150	2325	2498	ATNL10118440004	PW29100139	909139824	51	3	0.981	6.9	13	33	4.1E-9	2.0E-9
9	GTG0135040010	04/12/24	15.5	150	2325	2495	ATNL10118440004	PW29100139	909139824	51	4	0.981	6.9	13	33	4.1E-9	2.0E-9
10	GTG0135040011	04/12/24	15.5	150	2325	2476	ATNL10118440004	PW29100139	909139824	51	4	0.981	6.9	13	33	4.1E-9	2.0E-9
11	GTG0135040012	04/12/24	15.5	150	2325	2452	ATNL10118440004	PW29100139	909139824	51	4	0.981	6.9	13	33	4.1E-9	2.0E-9
12	GTG0135040013	04/12/24	15.5	150	2325	2464	ATNL10118440004	PW29100139	909139824	51	4	0.981	6.9	13	33	4.1E-9	2.0E-9
13	GTG0135040014	04/12/24	15.5	150	2325	2559	ATNL10118440004	PW29100139	909139824	51	4	0.981	6.9	13	33	4.1E-9	2.0E-9
14	GTG0135040015	04/12/24	15.5	150	2325	2619	ATNL10117610056	PW29100139	909139824	51	4	0.981	6.9	13	33	4.1E-9	2.0E-9
15	GTG0135040016	04/12/24	15.5	150	2325	2663	ATNL10117610014	PW29100139	909139824	51	4	0.981	6.9	13	33	4.1E-9	2.0E-9
16	GTG0135040017	04/12/24	15.5	150	2325	2702	ATNL10117610014	PW29100139	909139824	51	4	0.981	6.9	13	33	4.1E-9	2.0E-9
17	GTG0135040019	04/12/24	15.5	150	2325	2582	ATNL10117610014	PW29100139	909139824	54	3	0.858	7.8	13	33	4.1E-9	2.0E-9
18	GTG0135040020	04/12/24	15.5	150	2325	2627	ATNL10117610014	PW29100139	909139824	54	3	0.858	7.8	13	33	4.1E-9	2.0E-9
19	GTG0135040021	04/12/24	15.5	150	2325	2566	ATNL10117610014	PW27001111	909139824	54	3	0.858	7.8	13	33	4.1E-9	2.0E-9
20	GTG0135040022	04/12/24	15.5	150	2325	2562	ATNL10117610014	PW27001111	909139824	54	3	0.858	7.8	13	33	4.1E-9	2.0E-9
21	GTG0135040023	04/12/24	15.5	150	2325	2653	ATNL10117610009	PW27001111	909139824	54	3	0.858	7.8	13	33	4.1E-9	2.0E-9
22	GTG0135040024	04/12/24	15.5	150	2325	2649	ATNL10117610009	PW27001111	909139824	54	3	0.858	7.8	13	33	4.1E-9	2.0E-9
23	GTG0135040025	04/12/24	15.5	150	2325	2754	ATNL10117610009	PW27001111	909139824	54	3	0.858	7.8	13	33	4.1E-9	2.0E-9
24	GTG0135040026	04/12/24	15.5	150	2325	2655	ATNL10117610009	PW27001111	909139824	54	3	0.858	7.8	13	33	4.1E-9	2.0E-9
25	GTG0135040027	04/12/24	15.5	150	2325	2679	ATNL10118440029	PW27001111	909139824	54	4	0.858	7.8	13	33	4.1E-9	2.0E-9
26	GTG0135040028	04/12/24	15.5	150	2325	2783	ATNL10118440029	PW27001111	909139824	54	4	0.858	7.8	13	33	4.1E-9	2.0E-9
27	GTG0135040029	04/12/24	15.5	150	2325	2792	ATNL10118440029	PW27001111	909139824	54	4	0.858	7.8	13	33	4.1E-9	2.0E-9
28	GTG0135040030	04/12/24	15.5	150	2325	2765	ATNL10118440010	PW27001111	909139824	54	4	0.858	7.8	13	33	4.1E-9	2.0E-9
29	GTG0135040031	04/12/24	15.5	150	2325	2744	ATNL10118440010	PW27001111	909139824	54	4	0.858	7.8	13	33	4.1E-9	2.0E-9
30	GTG0135040032	04/12/24	15.5	150	2325	2772	ATNL10118440010	PW27001111	909139824	54	4	0.858	7.8	13	33	4.1E-9	2.0E-9
31	GTG0135040033	04/12/24	15.5	150	2325	2805	ATNL10118440010	PW27001111	909139824	54	4	0.858	7.8	13	33	4.1E-9	2.0E-9

#	Roll Number	Production Date	Width (ft)	Length (ft)	Area (sqft)	Weight	CAP Roll #	BASE Roll #	Bentonite Lot	ASTM D6768	ASTM D6496	ASTM D5993		ASTM D5891	ASTM D5890	ASTM D5887	
										Tensile Strength	Peel Strength	Bentonite Mass	Moisture Content	Fluid Loss	Swell Index	Index Flux	Hydraulic Conductivity
										ppi	ppi	lb/ft2	%	ml	ml/2 g	m3/m2/s	cm/s
32	GTG0135040034	04/12/24	15.5	150	2325	2726	ATNL10118440010	PW27001111	909139824	54	4	0.858	7.8	13	33	4.1E-9	2.0E-9
33	GTG0135040035	04/12/24	15.5	150	2325	2689	ATNL10118440010	PW27001111	909139824	51	3	0.846	7.9	13	33	4.1E-9	2.0E-9
34	GTG0135040036	04/12/24	15.5	150	2325	2716	ATNL10118440021	PW27001111	909139824	51	3	0.846	7.9	13	33	4.1E-9	2.0E-9
35	GTG0135040037	04/12/24	15.5	150	2325	2581	ATNL10118440021	PW27001111	909139824	51	3	0.846	7.9	13	33	4.1E-9	2.0E-9
36	GTG0135040038	04/12/24	15.5	150	2325	2787	ATNL10118440021	PW27001111	909139824	51	3	0.846	7.9	13	33	4.1E-9	2.0E-9
37	GTG0135040039	04/12/24	15.5	150	2325	2665	ATNL10118440021	PW27001111	909139824	51	3	0.846	7.9	13	33	4.1E-9	2.0E-9
38	GTG0135040040	04/12/24	15.5	150	2325	2712	ATNL10118440021	PW27001111	909139824	51	3	0.846	7.9	13	33	4.1E-9	2.0E-9
39	GTG0135040041	04/12/24	15.5	150	2325	2707	ATNL10118440038	PW27001111	909139824	51	3	0.846	7.9	13	33	4.1E-9	2.0E-9
40	GTG0135040042	04/12/24	15.5	150	2325	2762	ATNL10118440038	PW27001111	909139824	51	3	0.846	7.9	13	33	4.1E-9	2.0E-9
41	GTG0135040043	04/12/24	15.5	150	2325	2769	ATNL10118440038	PW27001111	909139824	51	2	0.846	7.9	13	33	4.1E-9	2.0E-9
42	GTG0135040044	04/12/24	15.5	150	2325	2796	ATNL10118440038	PW27001111	909139824	51	2	0.846	7.9	13	33	4.1E-9	2.0E-9
43	GTG0135040045	04/12/24	15.5	150	2325	2841	ATNL10118440038	PW27001111	909139824	51	2	0.846	7.9	13	33	4.1E-9	2.0E-9
44	GTG0135040046	04/12/24	15.5	150	2325	2888	ATNL10118440038	PW27001111	909139824	51	2	0.846	7.9	13	33	4.1E-9	2.0E-9
45	GTG0135040047	04/12/24	15.5	150	2325	2845	ATNL10118440038	PW27001111	909139824	51	2	0.846	7.9	13	33	4.1E-9	2.0E-9
46	GTG0135040048	04/12/24	15.5	150	2325	2821	ATNL10118440038	PW27001111	909139824	51	2	0.846	7.9	13	33	4.1E-9	2.0E-9
47	GTG0135040049	04/12/24	15.5	150	2325	2841	ATNL10118440005	PW27001111	909139824	51	2	0.846	7.9	13	33	4.1E-9	2.0E-9
48	GTG0135040050	04/12/24	15.5	150	2325	2797	ATNL10118440005	PW27001111	909139824	51	2	0.846	7.9	13	33	4.1E-9	2.0E-9
49	GTG0135040051	04/12/24	15.5	150	2325	2791	ATNL10118440005	PW27001111	909139824	54	2	1.015	8.7	13	33	4.1E-9	2.0E-9
50	GTG0135040052	04/12/24	15.5	150	2325	2917	ATNL10118440005	PW27001111	909139824	54	2	1.015	8.7	13	33	4.1E-9	2.0E-9
51	GTG0135040053	04/12/24	15.5	150	2325	2848	ATNL10118440005	PW27001111	909139824	54	2	1.015	8.7	13	33	4.1E-9	2.0E-9

Tom Nichols

Tom Nichols, Corporate Quality Director

For Questions, Please Contact:

Corporate Quality Director
Tom Nichols
843-546-0600
Ext 1063

PO # / PROJECT: **GCL PO #**

PRODUCT / STYLE NAME: **3.5oz MARV**

DATE: **5/23/2023**

ASTM	D5261	D4632				D4833	D5199	
Method	Average Weight	Average Grab Tensile(MD)	Average Grab Tensile(CD)	Average Elongation (MD)	Average Elongation (CD)	Average Puncture Resist.	THICKNESS	Roll Length
Units	oz / yd^2	Lbs	Lbs	%	%	Lbs	Units: mils	ft
Roll Number								
*ATNL10118440004	5.25	70.00	25.00	144	192	45.00	146.000	950
*ATNL10118440005	5.25	70.00	25.00	144	192	45.00	146.000	950
*ATNL10118440010	5.42	45.00	86.00	198	137	49.00	151.000	950
*ATNL10118440021	5.44	37.00	71.00	201	151	48.00	132.000	652
*ATNL10118440029	5.13	35.00	78.00	203	142	43.00	132.000	478
*ATNL10118440038	5.72	54.00	137.00	201	152	65.00	127.000	950

Mark Lockliear, Lab Manager, Agru Andrews

PO # / PROJECT: **GCL PO #**
PRODUCT / STYLE NAME: **3.5oz MARV**
DATE: **5/10/2023**

ASTM	D5261	D4632				D4833	D5199	
Method	Average Weight	Average Grab Tensile(MD)	Average Grab Tensile(CD)	Average Elongation (MD)	Average Elongation (CD)	Average Puncture Resist.	THICKNESS	Roll Length
Units	oz / yd^2	Lbs	Lbs	%	%	Lbs	Units: mils	ft
Roll Number								
*ATNL10117610009	5.39	63.00	111.00	218	164	44.00	129.000	950
*ATNL10117610014	6.34	58.00	96.00	200	141	42.00	151.000	950
*ATNL10117610056	6.16	45.00	89.00	201	142	58.00	154.000	950
*ATNL10117610060	6.51	46.00	132.00	178	134	50.00	160.000	950

Mark Lockliear, Lab Manager, Agru Andrews

Certificate of Analysis

Shaw Ind. Primary Backing **3/22/2024**

Bill of Ladings -MSR6093407 SEvans@AgruAmerica.com

Agru Bill of Lading - 618430 TNichols@AgruAmerica.com

	ASTM D-5261	ASTM D-4632	ASTM D-4632	ASTM D-4632	ASTM D-4632
Primary Roll #	Fabric Weight (oz/yd2)	Machine Tensile (lbs.)	Machine Elongation (%)	X-Machine Tensile (lbs.)	X-Machine Elongation (%)
*PW27001111	3.2	134	39	107	28
*PW29100139	3.2	136	39	99	28

BENTONITE
CERTIFICATE OF ANALYSIS 2024

BENTONITE PERFORMANCE MINERALS LLC
554 US HWY 212
COLONY PLANT
BELLE FOURCHE, SD 57717

TO: **AGRU AMERICA**
500 Garrison Rd
Georgetown, SC 29440

A shipment of **NATIONAL® GRANULAR 30** Tests Conducted By:

Approved By:

Car/Truck No.	Date Left Plant	Order Number	Weight (Tons)	Weight (Pounds)
CRDX 11150	**02-11-24**	**909139824**	**93.57**	**187,140**

A sample from this shipment was tested, and gave the following results:

Test:	MOISTURE	%+20 MESH	%- 200 MESH	FLUID LOSS	FREE SWELL
Method:	ASTM D 2216	ASTM C 136	ASTM C 136	ASTM D 5891	ASTM D 5890
Specification:	**12.0% MAX.**	**15 MAX**	**10 MAX.**	**18.0 MAX.**	**25 MIN.**
A (50 Tons)	**9.4**	**0.39**	**6.28**	**13.6**	**33**
B (50 Tons)	**9.9**	**0.19**	**4.2**	**12.0**	**35**

Lot Numbers

Appendix H-2 Interface Friction Angle Test Results

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059		
Start Date:	05/30/24	Tested By:	jb
End Date:	06/04/24	Checked By:	jsc
Sample ID:	GCL Roll# : GTG0135040020		
Description:	White woven/ White non-woven		

Index Flux of GCL Using Flex Wall Permeameter by ASTM D5887

Permeant Fluid: De-ionized water
Cell #: 0
Sample Preparation: Cut with circular die, trimmed with scissors and placed into permeameter; adjacent portion moisture content = 9.8%

Parameter	Initial	Final
Height, in	0.24	0.28
Diameter, in	4.00	4.00
Area, in^2	12.6	12.6
Volume, in^3	---	3.52
Mass, g	39.2	78.3
Bulk Density, pcf	---	84.6
Moisture Content, %	9.8	83.2
Dry Density, pcf	---	46.2

CONSOLIDATION AND BACK PRESSURE SATURATION

Initial/Final Cell Pressure, psi: 79.97/85.02 Pressure Increment, psi: 5.05/4.32
Initial/Final Sample Pressure, psi: 74.96/79.28 *Final pressures maintained at least 48 hours prior to flow

FLOW DATA:

Date	Elapsed Time, sec	Pressure, psi			Flow Volume, cc				Average Flow, cc	Average Flow Rate, cc/sec	Index Flux, $(cm^3/cm^2)/sec$
		Cell	Inlet	Outlet	In	Out	Δ In	Δ Out			
	---	80.0	77.0	75.0	7.00	11.00	---	---	---	---	---
6/4	8055	80.0	77.0	75.0	7.20	10.80	0.20	0.20	0.20	2.5E-05	3.1E-07
	----	80.0	77.0	75.0	7.00	11.00	---	---	---	---	---
6/4	7495	80.0	77.0	75.0	7.20	10.80	0.20	0.20	0.20	2.7E-05	3.3E-07
	----	80.0	77.0	75.0	7.00	11.00	---	---	---	---	---
6/4	8953	80.0	77.0	75.0	7.25	10.75	0.25	0.25	0.25	2.8E-05	3.4E-07

INDEX FLUX @ 2 PSI PRESSURE DIFFERENCE: 3.27 x 10-07 $cm^3/cm^2/sec$
3.27 x 10-09 $m^3/m^2/sec$

PERMEABILITY @ 4 PSI EFFECTIVE STRESS and 20 °C: 1.65 x 10-09 cm/sec

Comments: Actual area of specimen after test used to calculate Index Flux
After test height of bentonite measured only (geotextile portions not included)
Permeability calculation based on height of bentonite portion only

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059	Tested By:	est
Test Date:	05/30/24	Checked By:	dln
Sample ID:	Roll #GTG0135040020		
Description:	White, nonwoven/woven Agru GCL		

Measuring Mass Per Unit Area of Geosynthetic Clay Liners by ASTM D5993

Sample Size:	3 ft x roll width	Drying Method:	oven
Specimen Size:	4 in x 8 in	Drying Time, hrs:	16 hrs
Specimen Shape:	rectangle	Drying Temperature, °C:	110 +/- 5
Cutting Method:	die		
Assumed Mass of Synthetic Component, g/m^2:	305.0		

Specimen Number	Mass Per Unit Area				Moisture Content of Clay Component of GCL, %
	Dried GCL (m_{GCL})		Dried Clay Component of GCL (m_{clay})		
	g/m^2	lb/ft^2	g/m^2	lb/ft^2	
A	5493	1.13	5188	1.06	11.1
B	5488	1.12	5183	1.06	10.3
C	6305	1.29	6000	1.23	11.5
D	5551	1.14	5246	1.07	11.4
E	5319	1.09	5014	1.03	11.0
Average	5631	1.15	5326	1.09	11.1

Comments:

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059		
Start Date:	05/30/24	Tested By:	est
End Date:	06/07/24	Checked By:	dln
GCL ID:	Roll #GTG0135040020		
GCL Description:	White, nonwoven/woven Agru GCL		
Geomembrane ID:	Roll #GTD0134780047		
Geomembrane Description:	Black, 40 mil Agru microspike LLDPE		

Interface Shear Test Series by ASTM D6243

Test Series #:	1
Test Profile - Top to Bottom:	steel plate / GEOMEMBRANE / GCL / spiked gripping surface
GCL / Geosynthetic Preparation:	Test set-up saturated at normal load for 48 hours prior to shear. The glossy side of the geomembrane was placed against the nonwoven side of the GCL.
Test Equipment:	Top box = 12 in x 12 in; Bottom box = 12 in x 12 in; Load cells and LVDTs connected to data acquisition system for shear force, normal load and horizontal displacement readings; Flat plate clamping device; surface area = 144 in^2
Horizontal Displacement, in/min:	0.004 Test Condition: inundated

Parameter	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6
GCL Initial Moisture Content, %	9.8	10.2	10.2	---	---	---
GCL Final Moisture Content, %	191.4	157.9	120.9	---	---	---
Normal Compressive Stress, psi	1.0	5.0	10	---	---	---
Peak Shear Stress, psi	1.3	4.4	8.6	---	---	---
Post Peak Shear Stress, psi	0.8	3.4	5.9	---	---	---
Peak Secant Friction Angle, °	52.2	41.5	40.8	---	---	---
Post-Peak Secant Friction Angle, °	38.4	34.5	30.3	---	---	---
Pre-Test: Average Asperity, mils	35.8	36.1	36.4	---	---	---

NOTES: Asperity measurements taken on side of membrane involved in shear plane in general accordance with ASTM D7466. Six measurements taken before test.

Peak Friction Angle:	**39.3**	**degrees**
Peak Adhesion:	**0.4**	**psi**
Post Peak Friction Angle:	**29.2**	**degrees**
Post Peak Adhesion:	**0.4**	**psi**

Figure a. Shear Force vs. Horizontal Displacement

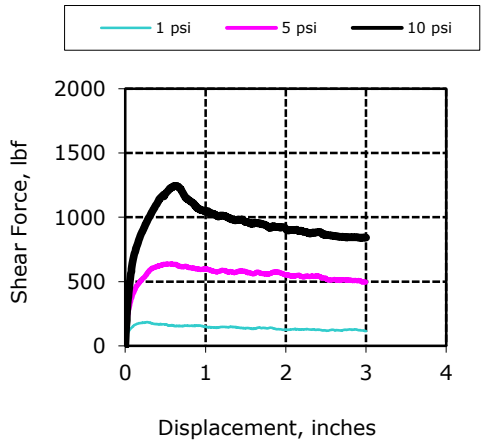
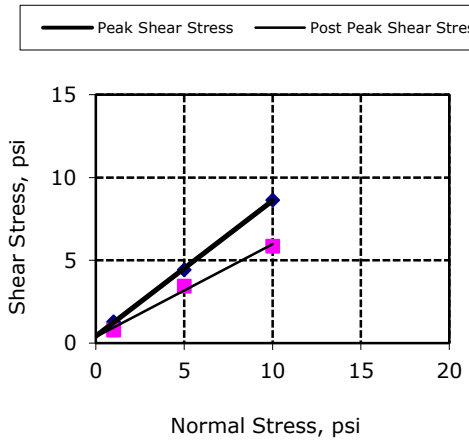


Figure b. Shear Stress vs. Normal Stress



Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material. Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.

Client:	New England Liner Systems	
Project Name:	Ledge Road LF Cap	
Project Location:	Andover, MA	
GTX #:	319059	
Start Date:	05/30/24	Tested By: est
End Date:	06/07/24	Checked By: dln
GCL ID:	Roll #GTG0135040020	
GCL Description:	White, nonwoven/woven Agru GCL	
Geomembrane ID:	Roll #GTD0134780047	
Geomembrane Description:	Black, 40 mil Agru microspike LLDPE	

Interface Shear Test Series by ASTM D6243

Post-Shear Photos

Point 1 - 1 psi
(Geomembrane)

(GCL)

Point 2 - 5 psi
(Geomembrane)

(GCL)

Point 3 - 10 psi
(Geomembrane)

(GCL)

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material. Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059		
Start Date:	05/30/24	Tested By:	est
End Date:	06/03/24	Checked By:	dln
Soil ID:	Drainage Sand		
Soil Description:	Moist, yellowish brown sand with gravel		
GCL ID:	Roll #GTG0135040020		
GCL Description:	White, nonwoven/woven Agru GCL		

Interface Shear Test Series by ASTM D6243

Test Series #:	2		
Test Profile - Top to Bottom:	steel plate / SOIL / GCL / spiked gripping surface		
Soil Preparation:	The soil was compacted with moderate effort at the as-received moisture content. Values specified by client.		
Compaction Characteristics:	Maximum Dry Density	---	pcf
	Optimum Moisture Content	---	%
	Compaction Test Method	---	
Geosynthetic Preparation:	Test set-up saturated at normal load for 48 hours prior to shear. The soil was placed against the woven side of the GCL.		
Test Equipment:	Top box = 12 in x 12 in; Bottom box = 12 in x 12 in; Load cells and LVDTs connected to data acquisition system for shear force, normal load and horizontal displacement readings; Flat plate clamping device; surface area = 144 in^2		
Horizontal Displacement, in/min:	0.004	Test Condition:	inundated

Parameter	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6
Soil Initial Moisture Content, %	1.5	1.6	1.5	---	---	---
Soil Initial Dry Density, pcf	102.4	102.4	102.5	---	---	---
Soil Percent Compaction, %	----	---	---	---	---	---
Soil Final Moisture Content, %	17.1	15.6	14.5	---	---	---
GCL Initial Moisture Content, %	9.8	10.0	10.2	---	---	---
GCL Final Moisture Content, %	147.5	139.4	98.3	---	---	---
Normal Compressive Stress, psi	1.0	5.0	10	---	---	---
Peak Shear Stress, psi	0.7	3.4	7.0	---	---	---
Post Peak Shear Stress, psi	0.7	3.4	6.8	---	---	---
Peak Secant Friction Angle, °	36.7	34.5	35.0	---	---	---
Post-Peak Secant Friction Angle, °	34.2	34.1	34.2	---	---	---

NOTES:

Peak Friction Angle:	**34.8**	**degrees**
Peak Adhesion:	**0.0**	**psi**
Post Peak Friction Angle:	**34.2**	**degrees**
Post Peak Adhesion:	**0.0**	**psi**

Figure a. Shear Force vs. Horizontal Displacement

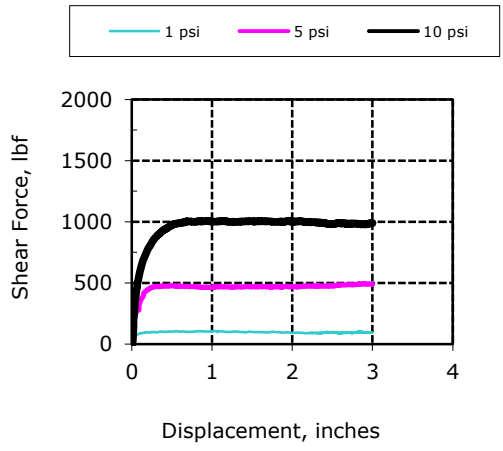
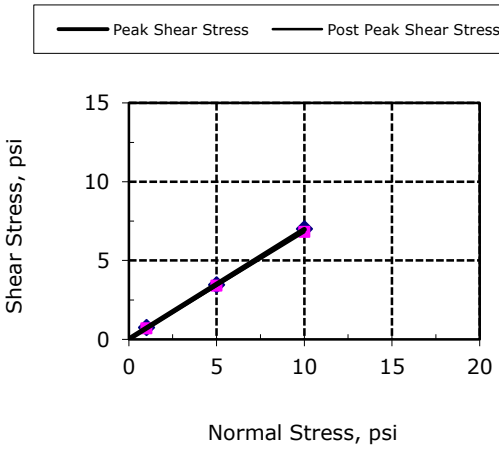


Figure b. Shear Stress vs. Normal Stress



Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material. Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.

Client:	New England Liner Systems	
Project Name:	Ledge Road LF Cap	
Project Location:	Andover, MA	
GTX #:	319059	
Start Date:	05/30/24	Tested By: est
End Date:	06/03/24	Checked By: dln
Soil ID:	Drainage Sand	
Soil Description:	Moist, yellowish brown sand with gravel	
GCL ID:	Roll #GTG0135040020	
GCL Description:	White, nonwoven/woven Agru GCL	

Interface Shear Test Series by ASTM D6243

Post-Shear Photos

Point 1 - 1 psi

Point 2 - 5 psi

Point 3 - 10 psi

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material. Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.

Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059		
Start Date:	05/30/24	Tested By:	est
End Date:	06/10/24	Checked By:	dln
GCL ID:	Roll #GTG0135040020		
GCL Description:	White, nonwoven/woven Agru GCL		

Internal Shear of GCL Test Series by ASTM D6243

Test Series #:	3
Test Profile - Top to Bottom:	spiked gripping surface / GCL / spiked gripping surface
Geosynthetic Preparation:	Test set-up saturated at normal load for 48 hours prior to shear.
Test Equipment:	Top box = 12 in x 12 in; Bottom box = 12 in x 12 in; Load cells and LVDTs connected to data acquisition system for shear force, normal load and horizontal displacement readings; surface area = 144 in^2
Horizontal Displacement, in/min:	0.004
Test Condition:	inundated

Parameter	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6
Initial Moisture Content, %	9.6	9.8	9.6	---	---	---
Final Moisture Content, %	297.3	183.8	134.7	---	---	---
Normal Compressive Stress, psi	1.0	5.0	10	---	---	---
Peak Shear Stress, psi	3.8	7.6	12	---	---	---
Post-Peak Shear Stress, psi	1.3	1.4	2.4	---	---	---
Peak Secant Friction Angle, °	75.2	56.6	49.4	---	---	---
Post-Peak Secant Friction Angle, °	53.3	15.2	13.4	---	---	---
In-Line Peel Strength, lbs/in	3.4	4.0	4.5	---	---	---

NOTES:
1 psi: Internal Failure on about 60% of test specimen
5 psi: Internal Failure on about 100% of test specimen
10 psi: Internal Failure on about 100% of test specimen

Peak Friction Angle:	**41.0**	**degrees**
Peak Adhesion:	**3.0**	**psf**
Post-Peak Friction Angle	**6.8**	**degrees**
Post-Peak Adhesion:	**1.1**	**psf**

Figure a. Shear Force vs. Horizontal Displacement

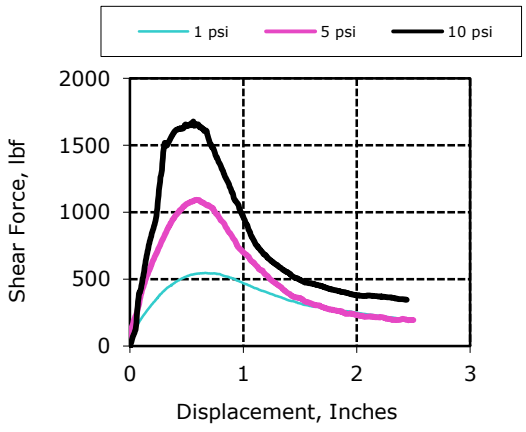
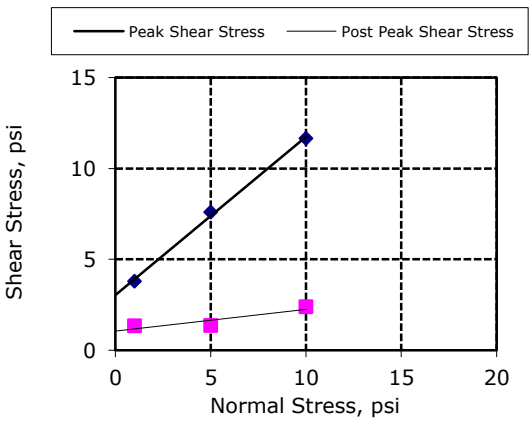


Figure b. Shear Stress vs. Normal Stress



Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material. Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.

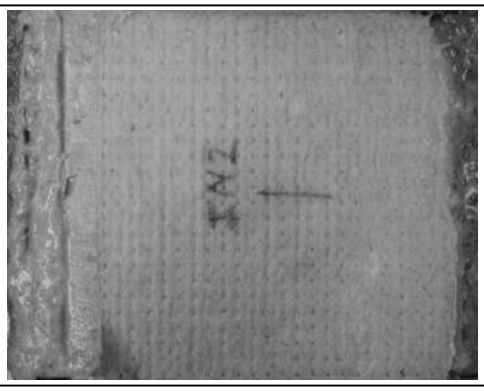
Client:	New England Liner Systems		
Project Name:	Ledge Road LF Cap		
Project Location:	Andover, MA		
GTX #:	319059		
Start Date:	05/30/24	Tested By:	est
End Date:	06/10/24	Checked By:	dln
GCL ID:	Roll #GTG0135040020		
GCL Description:	White, nonwoven/woven Agru GCL		

Internal Shear of GCL Test Series by ASTM D6243

Post-Shear Photos

Point 1 - 1 psi

Point 2 - 5 psi



Point 3 - 10 psi

Notes: These results apply only to the sample tested for the specific test conditions. The test procedures employed follow accepted industry practice and the indicated test method. GeoTesting Express has no specific knowledge as to conditioning, origin, sampling procedure or intended use of the material. Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.

Appendix I Topsoil Test Results

ANALYTICAL REPORT

Lab Number:	L2358905
Client:	J. Bates & Son, LLC P.O Box 997 Clinton, MA 01510
ATTN:	Seth Mcnally
Phone:	(978) 368-7001
Project Name:	ANDOVER LANDFILL
Project Number:	Not Specified
Report Date:	10/16/23

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: ANDOVER LANDFILL
Project Number: Not Specified

Lab Number: L2358905
Report Date: 10/16/23

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2358905-01	CONCORD NH LOAM	SOIL	ANDOVER, MA	10/05/23 10:00	10/05/23

Project Name:	ANDOVER LANDFILL	**Lab Number:**	L2358905
Project Number:	Not Specified	**Report Date:**	10/16/23

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	YES

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	ANDOVER LANDFILL	**Lab Number:**	L2358905
Project Number:	Not Specified	**Report Date:**	10/16/23

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name:	ANDOVER LANDFILL	**Lab Number:**	L2358905
Project Number:	Not Specified	**Report Date:**	10/16/23

Case Narrative (continued)

MCP Related Narratives

Sample Receipt

The analyses performed were specified by the client.

The samples were received at the laboratory above the required temperature range. The samples were transported to the laboratory in a cooler with ice and delivered directly from the sampling site. This is considered acceptable since the samples were in the process of cooling.

In reference to question H:

A Matrix Spike was not submitted for the analysis of Total Metals.

Volatile Organics

L2358905-01: Initial calibration utilized a quadratic fit for: trichloroethene, bromodichloromethane, p/m xylene

In reference to question H:

L2358905-01: Initial Calibration did not meet:

Lowest Calibration Standard Minimum Response Factor: 1,4-dioxane (0.0029)

Average Response Factor: 1,4-dioxane

L2358905-01: The associated continuing calibration standard is outside the acceptance criteria for several compounds; however, it is within overall method allowances. Associated results are considered to be biased high if the %D is negative and biased low if the %D is positive. A copy of the continuing calibration standard is included as an addendum to this report.

Semivolatile Organics

WG1835734-1 and WG1835734-2/-3: The initial calibration utilized a quadratic fit for 2,4-Dinitrophenol, Pentachlorophenol

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Melissa Sturgis Melissa Sturgis

Title: Technical Director/Representative Date: 10/16/23

QC OUTLIER SUMMARY REPORT

Project Name: ANDOVER LANDFILL
Project Number: Not Specified

Lab Number: L2358905
Report Date: 10/16/23

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment

There are no QC Outliers associated with this report.

ORGANICS

VOLATILES

Project Name: ANDOVER LANDFILL **Lab Number:** L2358905

Project Number: Not Specified **Report Date:** 10/16/23

SAMPLE RESULTS

Lab ID: L2358905-01 Date Collected: 10/05/23 10:00
Client ID: CONCORD NH LOAM Date Received: 10/05/23
Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8260D
Analytical Date: 10/09/23 13:48
Analyst: AJK
Percent Solids: 83%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Methylene chloride	ND		ug/kg	4.4	--	1
1,1-Dichloroethane	ND		ug/kg	0.88	--	1
Chloroform	ND		ug/kg	1.3	--	1
Carbon tetrachloride	ND		ug/kg	0.88	--	1
1,2-Dichloropropane	ND		ug/kg	0.88	--	1
Dibromochloromethane	ND		ug/kg	0.88	--	1
1,1,2-Trichloroethane	ND		ug/kg	0.88	--	1
Tetrachloroethene	ND		ug/kg	0.44	--	1
Chlorobenzene	ND		ug/kg	0.44	--	1
Trichlorofluoromethane	ND		ug/kg	3.5	--	1
1,2-Dichloroethane	ND		ug/kg	0.88	--	1
1,1,1-Trichloroethane	ND		ug/kg	0.44	--	1
Bromodichloromethane	ND		ug/kg	0.44	--	1
trans-1,3-Dichloropropene	ND		ug/kg	0.88	--	1
cis-1,3-Dichloropropene	ND		ug/kg	0.44	--	1
1,3-Dichloropropene, Total	ND		ug/kg	0.44	--	1
1,1-Dichloropropene	ND		ug/kg	0.44	--	1
Bromoform	ND		ug/kg	3.5	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.44	--	1
Benzene	ND		ug/kg	0.44	--	1
Toluene	ND		ug/kg	0.88	--	1
Ethylbenzene	ND		ug/kg	0.88	--	1
Chloromethane	ND		ug/kg	3.5	--	1
Bromomethane	ND		ug/kg	1.8	--	1
Vinyl chloride	ND		ug/kg	0.88	--	1
Chloroethane	ND		ug/kg	1.8	--	1
1,1-Dichloroethene	ND		ug/kg	0.88	--	1
trans-1,2-Dichloroethene	ND		ug/kg	1.3	--	1

Project Name: ANDOVER LANDFILL **Lab Number:** L2358905

Project Number: Not Specified **Report Date:** 10/16/23

SAMPLE RESULTS

Lab ID: L2358905-01 Date Collected: 10/05/23 10:00

Client ID: CONCORD NH LOAM Date Received: 10/05/23

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Trichloroethene	ND		ug/kg	0.44	--	1
1,2-Dichlorobenzene	ND		ug/kg	1.8	--	1
1,3-Dichlorobenzene	ND		ug/kg	1.8	--	1
1,4-Dichlorobenzene	ND		ug/kg	1.8	--	1
Methyl tert butyl ether	ND		ug/kg	1.8	--	1
p/m-Xylene	ND		ug/kg	1.8	--	1
o-Xylene	ND		ug/kg	0.88	--	1
Xylenes, Total	ND		ug/kg	0.88	--	1
cis-1,2-Dichloroethene	ND		ug/kg	0.88	--	1
1,2-Dichloroethene, Total	ND		ug/kg	0.88	--	1
Dibromomethane	ND		ug/kg	1.8	--	1
1,2,3-Trichloropropane	ND		ug/kg	1.8	--	1
Styrene	ND		ug/kg	0.88	--	1
Dichlorodifluoromethane	ND		ug/kg	8.8	--	1
Acetone	ND		ug/kg	22	--	1
Carbon disulfide	ND		ug/kg	8.8	--	1
Methyl ethyl ketone	ND		ug/kg	8.8	--	1
Methyl isobutyl ketone	ND		ug/kg	8.8	--	1
2-Hexanone	ND		ug/kg	8.8	--	1
Bromochloromethane	ND		ug/kg	1.8	--	1
Tetrahydrofuran	ND		ug/kg	3.5	--	1
2,2-Dichloropropane	ND		ug/kg	1.8	--	1
1,2-Dibromoethane	ND		ug/kg	0.88	--	1
1,3-Dichloropropane	ND		ug/kg	1.8	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	0.44	--	1
Bromobenzene	ND		ug/kg	1.8	--	1
n-Butylbenzene	ND		ug/kg	0.88	--	1
sec-Butylbenzene	ND		ug/kg	0.88	--	1
tert-Butylbenzene	ND		ug/kg	1.8	--	1
o-Chlorotoluene	ND		ug/kg	1.8	--	1
p-Chlorotoluene	ND		ug/kg	1.8	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	2.6	--	1
Hexachlorobutadiene	ND		ug/kg	3.5	--	1
Isopropylbenzene	ND		ug/kg	0.88	--	1
p-Isopropyltoluene	ND		ug/kg	0.88	--	1
Naphthalene	ND		ug/kg	3.5	--	1
n-Propylbenzene	ND		ug/kg	0.88	--	1

Project Name: ANDOVER LANDFILL **Lab Number:** L2358905

Project Number: Not Specified **Report Date:** 10/16/23

SAMPLE RESULTS

Lab ID: L2358905-01 Date Collected: 10/05/23 10:00

Client ID: CONCORD NH LOAM Date Received: 10/05/23

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	1.8	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	1.8	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	1.8	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	1.8	--	1
Diethyl ether	ND		ug/kg	1.8	--	1
Diisopropyl Ether	ND		ug/kg	1.8	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	1.8	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	1.8	--	1
1,4-Dioxane	ND		ug/kg	70	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	113		70-130
Toluene-d8	112		70-130
4-Bromofluorobenzene	114		70-130
Dibromofluoromethane	105		70-130

Project Name: ANDOVER LANDFILL **Lab Number:** L2358905

Project Number: Not Specified **Report Date:** 10/16/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 10/09/23 09:43
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1837380-5					
Methylene chloride	ND		ug/kg	5.0	--
1,1-Dichloroethane	ND		ug/kg	1.0	--
Chloroform	ND		ug/kg	1.5	--
Carbon tetrachloride	ND		ug/kg	1.0	--
1,2-Dichloropropane	ND		ug/kg	1.0	--
Dibromochloromethane	ND		ug/kg	1.0	--
1,1,2-Trichloroethane	ND		ug/kg	1.0	--
Tetrachloroethene	ND		ug/kg	0.50	--
Chlorobenzene	ND		ug/kg	0.50	--
Trichlorofluoromethane	ND		ug/kg	4.0	--
1,2-Dichloroethane	ND		ug/kg	1.0	--
1,1,1-Trichloroethane	ND		ug/kg	0.50	--
Bromodichloromethane	ND		ug/kg	0.50	--
trans-1,3-Dichloropropene	ND		ug/kg	1.0	--
cis-1,3-Dichloropropene	ND		ug/kg	0.50	--
1,3-Dichloropropene, Total	ND		ug/kg	0.50	--
1,1-Dichloropropene	ND		ug/kg	0.50	--
Bromoform	ND		ug/kg	4.0	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.50	--
Benzene	ND		ug/kg	0.50	--
Toluene	ND		ug/kg	1.0	--
Ethylbenzene	ND		ug/kg	1.0	--
Chloromethane	ND		ug/kg	4.0	--
Bromomethane	ND		ug/kg	2.0	--
Vinyl chloride	ND		ug/kg	1.0	--
Chloroethane	ND		ug/kg	2.0	--
1,1-Dichloroethene	ND		ug/kg	1.0	--
trans-1,2-Dichloroethene	ND		ug/kg	1.5	--
Trichloroethene	ND		ug/kg	0.50	--

Project Name: ANDOVER LANDFILL **Lab Number:** L2358905

Project Number: Not Specified **Report Date:** 10/16/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 10/09/23 09:43
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1837380-5					
1,2-Dichlorobenzene	ND		ug/kg	2.0	--
1,3-Dichlorobenzene	ND		ug/kg	2.0	--
1,4-Dichlorobenzene	ND		ug/kg	2.0	--
Methyl tert butyl ether	ND		ug/kg	2.0	--
p/m-Xylene	ND		ug/kg	2.0	--
o-Xylene	ND		ug/kg	1.0	--
Xylenes, Total	ND		ug/kg	1.0	--
cis-1,2-Dichloroethene	ND		ug/kg	1.0	--
1,2-Dichloroethene, Total	ND		ug/kg	1.0	--
Dibromomethane	ND		ug/kg	2.0	--
1,2,3-Trichloropropane	ND		ug/kg	2.0	--
Styrene	ND		ug/kg	1.0	--
Dichlorodifluoromethane	ND		ug/kg	10	--
Acetone	ND		ug/kg	25	--
Carbon disulfide	ND		ug/kg	10	--
Methyl ethyl ketone	ND		ug/kg	10	--
Methyl isobutyl ketone	ND		ug/kg	10	--
2-Hexanone	ND		ug/kg	10	--
Bromochloromethane	ND		ug/kg	2.0	--
Tetrahydrofuran	ND		ug/kg	4.0	--
2,2-Dichloropropane	ND		ug/kg	2.0	--
1,2-Dibromoethane	ND		ug/kg	1.0	--
1,3-Dichloropropane	ND		ug/kg	2.0	--
1,1,1,2-Tetrachloroethane	ND		ug/kg	0.50	--
Bromobenzene	ND		ug/kg	2.0	--
n-Butylbenzene	ND		ug/kg	1.0	--
sec-Butylbenzene	ND		ug/kg	1.0	--
tert-Butylbenzene	ND		ug/kg	2.0	--
o-Chlorotoluene	ND		ug/kg	2.0	--

Project Name: ANDOVER LANDFILL
Project Number: Not Specified
Lab Number: L2358905
Report Date: 10/16/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 10/09/23 09:43
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1837380-5					
p-Chlorotoluene	ND		ug/kg	2.0	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	3.0	--
Hexachlorobutadiene	ND		ug/kg	4.0	--
Isopropylbenzene	ND		ug/kg	1.0	--
p-Isopropyltoluene	ND		ug/kg	1.0	--
Naphthalene	ND		ug/kg	4.0	--
n-Propylbenzene	ND		ug/kg	1.0	--
1,2,3-Trichlorobenzene	ND		ug/kg	2.0	--
1,2,4-Trichlorobenzene	ND		ug/kg	2.0	--
1,3,5-Trimethylbenzene	ND		ug/kg	2.0	--
1,2,4-Trimethylbenzene	ND		ug/kg	2.0	--
Diethyl ether	ND		ug/kg	2.0	--
Diisopropyl Ether	ND		ug/kg	2.0	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	2.0	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	2.0	--
1,4-Dioxane	ND		ug/kg	80	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	107		70-130
Toluene-d8	108		70-130
4-Bromofluorobenzene	107		70-130
Dibromofluoromethane	98		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LANDFILL
Project Number: Not Specified

Lab Number: L2358905
Report Date: 10/16/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1837380-3 WG1837380-4								
Methylene chloride	86		82		70-130	5		20
1,1-Dichloroethane	99		91		70-130	8		20
Chloroform	95		88		70-130	8		20
Carbon tetrachloride	81		74		70-130	9		20
1,2-Dichloropropane	97		93		70-130	4		20
Dibromochloromethane	99		97		70-130	2		20
1,1,2-Trichloroethane	104		102		70-130	2		20
Tetrachloroethene	100		93		70-130	7		20
Chlorobenzene	102		97		70-130	5		20
Trichlorofluoromethane	93		82		70-130	13		20
1,2-Dichloroethane	91		88		70-130	3		20
1,1,1-Trichloroethane	86		78		70-130	10		20
Bromodichloromethane	91		88		70-130	3		20
trans-1,3-Dichloropropene	106		104		70-130	2		20
cis-1,3-Dichloropropene	90		86		70-130	5		20
1,1-Dichloropropene	92		81		70-130	13		20
Bromoform	100		96		70-130	4		20
1,1,2,2-Tetrachloroethane	113		110		70-130	3		20
Benzene	96		88		70-130	9		20
Toluene	106		98		70-130	8		20
Ethylbenzene	106		99		70-130	7		20
Chloromethane	103		93		70-130	10		20
Bromomethane	82		77		70-130	6		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LANDFILL
Project Number: Not Specified

Lab Number: L2358905
Report Date: 10/16/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1837380-3 WG1837380-4								
Vinyl chloride	96		85		70-130	12		20
Chloroethane	93		82		70-130	13		20
1,1-Dichloroethene	90		78		70-130	14		20
trans-1,2-Dichloroethene	87		79		70-130	10		20
Trichloroethene	92		84		70-130	9		20
1,2-Dichlorobenzene	109		104		70-130	5		20
1,3-Dichlorobenzene	111		105		70-130	6		20
1,4-Dichlorobenzene	108		104		70-130	4		20
Methyl tert butyl ether	76		74		70-130	3		20
p/m-Xylene	108		100		70-130	8		20
o-Xylene	102		96		70-130	6		20
cis-1,2-Dichloroethene	89		82		70-130	8		20
Dibromomethane	89		87		70-130	2		20
1,2,3-Trichloropropane	115		111		70-130	4		20
Styrene	108		100		70-130	8		20
Dichlorodifluoromethane	81		71		70-130	13		20
Acetone	99		93		70-130	6		20
Carbon disulfide	84		74		70-130	13		20
Methyl ethyl ketone	99		94		70-130	5		20
Methyl isobutyl ketone	97		96		70-130	1		20
2-Hexanone	105		105		70-130	0		20
Bromochloromethane	88		84		70-130	5		20
Tetrahydrofuran	92		87		70-130	6		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LANDFILL
Project Number: Not Specified

Lab Number: L2358905
Report Date: 10/16/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1837380-3 WG1837380-4								
2,2-Dichloropropane	91		82		70-130	10		20
1,2-Dibromoethane	102		102		70-130	0		20
1,3-Dichloropropane	112		110		70-130	2		20
1,1,1,2-Tetrachloroethane	100		96		70-130	4		20
Bromobenzene	102		97		70-130	5		20
n-Butylbenzene	122		111		70-130	9		20
sec-Butylbenzene	116		104		70-130	11		20
tert-Butylbenzene	110		100		70-130	10		20
o-Chlorotoluene	115		106		70-130	8		20
p-Chlorotoluene	114		106		70-130	7		20
1,2-Dibromo-3-chloropropane	98		97		70-130	1		20
Hexachlorobutadiene	102		92		70-130	10		20
Isopropylbenzene	110		100		70-130	10		20
p-Isopropyltoluene	111		101		70-130	9		20
Naphthalene	103		104		70-130	1		20
n-Propylbenzene	116		107		70-130	8		20
1,2,3-Trichlorobenzene	105		104		70-130	1		20
1,2,4-Trichlorobenzene	106		102		70-130	4		20
1,3,5-Trimethylbenzene	111		102		70-130	8		20
1,2,4-Trimethylbenzene	110		103		70-130	7		20
Diethyl ether	79		76		70-130	4		20
Diisopropyl Ether	104		100		70-130	4		20
Ethyl-Tert-Butyl-Ether	92		90		70-130	2		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: ANDOVER LANDFILL

Project Number: Not Specified

Lab Number: L2358905

Report Date: 10/16/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1837380-3 WG1837380-4								
Tertiary-Amyl Methyl Ether	85		84		70-130	1		20
1,4-Dioxane	82		83		70-130	1		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	100		97		70-130
Toluene-d8	110		111		70-130
4-Bromofluorobenzene	104		102		70-130
Dibromofluoromethane	94		91		70-130

SEMIVOLATILES

Project Name: ANDOVER LANDFILL
Project Number: Not Specified
Lab Number: L2358905
Report Date: 10/16/23

SAMPLE RESULTS

Lab ID: L2358905-01
Client ID: CONCORD NH LOAM
Sample Location: ANDOVER, MA

Date Collected: 10/05/23 10:00
Date Received: 10/05/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 141,8270E
Analytical Date: 10/06/23 10:05
Analyst: CMM
Percent Solids: 83%

Extraction Method: EPA 3546
Extraction Date: 10/05/23 20:02

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	160	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	200	--	1
Hexachlorobenzene	ND		ug/kg	84	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	84	--	1
2-Chloronaphthalene	ND		ug/kg	200	--	1
1,2-Dichlorobenzene	ND		ug/kg	200	--	1
1,3-Dichlorobenzene	ND		ug/kg	200	--	1
1,4-Dichlorobenzene	ND		ug/kg	84	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	200	--	1
2,4-Dinitrotoluene	ND		ug/kg	84	--	1
2,6-Dinitrotoluene	ND		ug/kg	200	--	1
Azobenzene	ND		ug/kg	200	--	1
Fluoranthene	660		ug/kg	120	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	200	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	84	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	220	--	1
Hexachlorobutadiene	ND		ug/kg	200	--	1
Hexachloroethane	ND		ug/kg	84	--	1
Isophorone	ND		ug/kg	180	--	1
Naphthalene	ND		ug/kg	200	--	1
Nitrobenzene	ND		ug/kg	180	--	1
Bis(2-ethylhexyl)phthalate	290		ug/kg	200	--	1
Butyl benzyl phthalate	ND		ug/kg	200	--	1
Di-n-butylphthalate	ND		ug/kg	200	--	1
Di-n-octylphthalate	ND		ug/kg	200	--	1
Diethyl phthalate	ND		ug/kg	200	--	1
Dimethyl phthalate	ND		ug/kg	84	--	1
Benzo(a)anthracene	280		ug/kg	120	--	1

Project Name: ANDOVER LANDFILL **Lab Number:** L2358905

Project Number: Not Specified **Report Date:** 10/16/23

SAMPLE RESULTS

Lab ID: L2358905-01 Date Collected: 10/05/23 10:00

Client ID: CONCORD NH LOAM Date Received: 10/05/23

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(a)pyrene	350		ug/kg	160	--	1
Benzo(b)fluoranthene	500		ug/kg	120	--	1
Benzo(k)fluoranthene	160		ug/kg	120	--	1
Chrysene	380		ug/kg	120	--	1
Acenaphthylene	ND		ug/kg	160	--	1
Anthracene	ND		ug/kg	120	--	1
Benzo(ghi)perylene	240		ug/kg	160	--	1
Fluorene	ND		ug/kg	200	--	1
Phenanthrene	190		ug/kg	120	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	84	--	1
Indeno(1,2,3-cd)pyrene	270		ug/kg	160	--	1
Pyrene	570		ug/kg	120	--	1
Aniline	ND		ug/kg	240	--	1
4-Chloroaniline	ND		ug/kg	200	--	1
Dibenzofuran	ND		ug/kg	200	--	1
2-Methylnaphthalene	ND		ug/kg	84	--	1
Acetophenone	ND		ug/kg	200	--	1
2,4,6-Trichlorophenol	ND		ug/kg	84	--	1
2-Chlorophenol	ND		ug/kg	84	--	1
2,4-Dichlorophenol	ND		ug/kg	84	--	1
2,4-Dimethylphenol	ND		ug/kg	84	--	1
2-Nitrophenol	ND		ug/kg	430	--	1
4-Nitrophenol	ND		ug/kg	280	--	1
2,4-Dinitrophenol	ND		ug/kg	960	--	1
Pentachlorophenol	ND		ug/kg	400	--	1
Phenol	ND		ug/kg	200	--	1
2-Methylphenol	ND		ug/kg	200	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	290	--	1
2,4,5-Trichlorophenol	ND		ug/kg	200	--	1
Pyridine	ND		ug/kg	220	--	1
Biphenyl	ND		ug/kg	40	--	1

Project Name: ANDOVER LANDFILL **Lab Number:** L2358905

Project Number: Not Specified **Report Date:** 10/16/23

SAMPLE RESULTS

Lab ID: L2358905-01 Date Collected: 10/05/23 10:00

Client ID: CONCORD NH LOAM Date Received: 10/05/23

Sample Location: ANDOVER, MA Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	75		30-130
Phenol-d6	76		30-130
Nitrobenzene-d5	76		30-130
2-Fluorobiphenyl	66		30-130
2,4,6-Tribromophenol	65		30-130
4-Terphenyl-d14	62		30-130

Project Name: ANDOVER LANDFILL
Project Number: Not Specified
Lab Number: L2358905
Report Date: 10/16/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E
Analytical Date: 10/06/23 11:21
Analyst: IM

Extraction Method: EPA 3546
Extraction Date: 10/05/23 00:38

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01 Batch: WG1835734-1					
Acenaphthene	ND		ug/kg	130	--
1,2,4-Trichlorobenzene	ND		ug/kg	160	--
Hexachlorobenzene	ND		ug/kg	69	--
Bis(2-chloroethyl)ether	ND		ug/kg	69	--
2-Chloronaphthalene	ND		ug/kg	160	--
1,2-Dichlorobenzene	ND		ug/kg	160	--
1,3-Dichlorobenzene	ND		ug/kg	160	--
1,4-Dichlorobenzene	ND		ug/kg	69	--
3,3'-Dichlorobenzidine	ND		ug/kg	160	--
2,4-Dinitrotoluene	ND		ug/kg	69	--
2,6-Dinitrotoluene	ND		ug/kg	160	--
Azobenzene	ND		ug/kg	160	--
Fluoranthene	ND		ug/kg	98	--
4-Bromophenyl phenyl ether	ND		ug/kg	160	--
Bis(2-chloroisopropyl)ether	ND		ug/kg	69	--
Bis(2-chloroethoxy)methane	ND		ug/kg	180	--
Hexachlorobutadiene	ND		ug/kg	160	--
Hexachloroethane	ND		ug/kg	69	--
Isophorone	ND		ug/kg	150	--
Naphthalene	ND		ug/kg	160	--
Nitrobenzene	ND		ug/kg	150	--
Bis(2-ethylhexyl)phthalate	ND		ug/kg	160	--
Butyl benzyl phthalate	ND		ug/kg	160	--
Di-n-butylphthalate	ND		ug/kg	160	--
Di-n-octylphthalate	ND		ug/kg	160	--
Diethyl phthalate	ND		ug/kg	160	--
Dimethyl phthalate	ND		ug/kg	69	--
Benzo(a)anthracene	ND		ug/kg	98	--
Benzo(a)pyrene	ND		ug/kg	130	--

Project Name: ANDOVER LANDFILL
Project Number: Not Specified
Lab Number: L2358905
Report Date: 10/16/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E
Analytical Date: 10/06/23 11:21
Analyst: IM

Extraction Method: EPA 3546
Extraction Date: 10/05/23 00:38

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01 Batch: WG1835734-1					
Benzo(b)fluoranthene	ND		ug/kg	98	--
Benzo(k)fluoranthene	ND		ug/kg	98	--
Chrysene	ND		ug/kg	98	--
Acenaphthylene	ND		ug/kg	130	--
Anthracene	ND		ug/kg	98	--
Benzo(ghi)perylene	ND		ug/kg	130	--
Fluorene	ND		ug/kg	160	--
Phenanthrene	ND		ug/kg	98	--
Dibenzo(a,h)anthracene	ND		ug/kg	69	--
Indeno(1,2,3-cd)pyrene	ND		ug/kg	130	--
Pyrene	ND		ug/kg	98	--
Aniline	ND		ug/kg	200	--
4-Chloroaniline	ND		ug/kg	160	--
Dibenzofuran	ND		ug/kg	160	--
2-Methylnaphthalene	ND		ug/kg	69	--
Acetophenone	ND		ug/kg	160	--
2,4,6-Trichlorophenol	ND		ug/kg	69	--
2-Chlorophenol	ND		ug/kg	69	--
2,4-Dichlorophenol	ND		ug/kg	69	--
2,4-Dimethylphenol	ND		ug/kg	69	--
2-Nitrophenol	ND		ug/kg	350	--
4-Nitrophenol	ND		ug/kg	230	--
2,4-Dinitrophenol	ND		ug/kg	790	--
Pentachlorophenol	ND		ug/kg	330	--
Phenol	ND		ug/kg	160	--
2-Methylphenol	ND		ug/kg	160	--
3-Methylphenol/4-Methylphenol	ND		ug/kg	240	--
2,4,5-Trichlorophenol	ND		ug/kg	160	--
Pyridine	ND		ug/kg	180	--

Project Name: ANDOVER LANDFILL
Project Number: Not Specified
Lab Number: L2358905
Report Date: 10/16/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E
Analytical Date: 10/06/23 11:21
Analyst: IM

Extraction Method: EPA 3546
Extraction Date: 10/05/23 00:38

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01 Batch: WG1835734-1					
Biphenyl	ND		ug/kg	33	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	66		30-130
Phenol-d6	67		30-130
Nitrobenzene-d5	58		30-130
2-Fluorobiphenyl	63		30-130
2,4,6-Tribromophenol	51		30-130
4-Terphenyl-d14	66		30-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LANDFILL
Project Number: Not Specified

Lab Number: L2358905
Report Date: 10/16/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01 Batch: WG1835734-2 WG1835734-3								
Acenaphthene	76		77		40-140	1		30
1,2,4-Trichlorobenzene	74		75		40-140	1		30
Hexachlorobenzene	68		69		40-140	1		30
Bis(2-chloroethyl)ether	75		75		40-140	0		30
2-Chloronaphthalene	73		80		40-140	9		30
1,2-Dichlorobenzene	81		78		40-140	4		30
1,3-Dichlorobenzene	80		79		40-140	1		30
1,4-Dichlorobenzene	80		77		40-140	4		30
3,3'-Dichlorobenzidine	76		82		40-140	8		30
2,4-Dinitrotoluene	92		93		40-140	1		30
2,6-Dinitrotoluene	81		86		40-140	6		30
Azobenzene	71		76		40-140	7		30
Fluoranthene	79		82		40-140	4		30
4-Bromophenyl phenyl ether	69		72		40-140	4		30
Bis(2-chloroisopropyl)ether	71		72		40-140	1		30
Bis(2-chloroethoxy)methane	75		76		40-140	1		30
Hexachlorobutadiene	70		71		40-140	1		30
Hexachloroethane	77		77		40-140	0		30
Isophorone	76		75		40-140	1		30
Naphthalene	81		82		40-140	1		30
Nitrobenzene	72		73		40-140	1		30
Bis(2-ethylhexyl)phthalate	113		109		40-140	4		30
Butyl benzyl phthalate	98		99		40-140	1		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LANDFILL
Project Number: Not Specified

Lab Number: L2358905
Report Date: 10/16/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01 Batch: WG1835734-2 WG1835734-3								
Di-n-butylphthalate	94		98		40-140	4		30
Di-n-octylphthalate	110		108		40-140	2		30
Diethyl phthalate	80		86		40-140	7		30
Dimethyl phthalate	76		84		40-140	10		30
Benzo(a)anthracene	83		88		40-140	6		30
Benzo(a)pyrene	99		90		40-140	10		30
Benzo(b)fluoranthene	90		79		40-140	13		30
Benzo(k)fluoranthene	90		91		40-140	1		30
Chrysene	94		90		40-140	4		30
Acenaphthylene	74		83		40-140	11		30
Anthracene	89		90		40-140	1		30
Benzo(ghi)perylene	87		81		40-140	7		30
Fluorene	75		81		40-140	8		30
Phenanthrene	85		86		40-140	1		30
Dibenzo(a,h)anthracene	84		86		40-140	2		30
Indeno(1,2,3-cd)pyrene	86		87		40-140	1		30
Pyrene	77		83		40-140	8		30
Aniline	69		68		40-140	1		30
4-Chloroaniline	62		68		40-140	9		30
Dibenzofuran	78		81		40-140	4		30
2-Methylnaphthalene	77		84		40-140	9		30
Acetophenone	86		85		40-140	1		30
2,4,6-Trichlorophenol	70		79		30-130	12		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LANDFILL
Project Number: Not Specified

Lab Number: L2358905
Report Date: 10/16/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01 Batch: WG1835734-2 WG1835734-3								
2-Chlorophenol	90		90		30-130	0		30
2,4-Dichlorophenol	88		90		30-130	2		30
2,4-Dimethylphenol	84		84		30-130	0		30
2-Nitrophenol	103		100		30-130	3		30
4-Nitrophenol	76		79		30-130	4		30
2,4-Dinitrophenol	57		68		30-130	18		30
Pentachlorophenol	58		65		30-130	11		30
Phenol	81		82		30-130	1		30
2-Methylphenol	85		87		30-130	2		30
3-Methylphenol/4-Methylphenol	86		84		30-130	2		30
2,4,5-Trichlorophenol	70		81		30-130	15		30
Pyridine	51		49		30-130	4		30
Biphenyl	80		86		40-140	7		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	84		84		30-130
Phenol-d6	84		84		30-130
Nitrobenzene-d5	74		78		30-130
2-Fluorobiphenyl	72		78		30-130
2,4,6-Tribromophenol	69		69		30-130
4-Terphenyl-d14	80		78		30-130

PCBS

Project Name: ANDOVER LANDFILL
Lab Number: L2358905
Project Number: Not Specified
Report Date: 10/16/23

SAMPLE RESULTS

Lab ID: L2358905-01
Client ID: CONCORD NH LOAM
Sample Location: ANDOVER, MA

Date Collected: 10/05/23 10:00
Date Received: 10/05/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8082A
Analytical Date: 10/06/23 09:52
Analyst: MEO
Percent Solids: 83%

Extraction Method: EPA 3546
Extraction Date: 10/05/23 21:23
Cleanup Method: EPA 3665A
Cleanup Date: 10/06/23
Cleanup Method: EPA 3660B
Cleanup Date: 10/06/23

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	55.5	--	1	A
Aroclor 1221	ND		ug/kg	55.5	--	1	A
Aroclor 1232	ND		ug/kg	55.5	--	1	A
Aroclor 1242	ND		ug/kg	55.5	--	1	A
Aroclor 1248	ND		ug/kg	55.5	--	1	A
Aroclor 1254	ND		ug/kg	55.5	--	1	A
Aroclor 1260	ND		ug/kg	55.5	--	1	A
Aroclor 1262	ND		ug/kg	55.5	--	1	A
Aroclor 1268	ND		ug/kg	55.5	--	1	A
PCBs, Total	ND		ug/kg	55.5	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	59		30-150	A
Decachlorobiphenyl	58		30-150	A
2,4,5,6-Tetrachloro-m-xylene	60		30-150	B
Decachlorobiphenyl	57		30-150	B

Project Name: ANDOVER LANDFILL
Project Number: Not Specified
Lab Number: L2358905
Report Date: 10/16/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082A
Analytical Date: 10/06/23 09:20
Analyst: MEO

Extraction Method: EPA 3546
Extraction Date: 10/05/23 21:23
Cleanup Method: EPA 3665A
Cleanup Date: 10/06/23
Cleanup Method: EPA 3660B
Cleanup Date: 10/06/23

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01 Batch: WG1836224-1						
Aroclor 1016	ND		ug/kg	47.3	--	A
Aroclor 1221	ND		ug/kg	47.3	--	A
Aroclor 1232	ND		ug/kg	47.3	--	A
Aroclor 1242	ND		ug/kg	47.3	--	A
Aroclor 1248	ND		ug/kg	47.3	--	A
Aroclor 1254	ND		ug/kg	47.3	--	A
Aroclor 1260	ND		ug/kg	47.3	--	A
Aroclor 1262	ND		ug/kg	47.3	--	A
Aroclor 1268	ND		ug/kg	47.3	--	A
PCBs, Total	ND		ug/kg	47.3	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	74		30-150	A
Decachlorobiphenyl	76		30-150	A
2,4,5,6-Tetrachloro-m-xylene	76		30-150	B
Decachlorobiphenyl	75		30-150	B

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LANDFILL
Project Number: Not Specified

Lab Number: L2358905
Report Date: 10/16/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01 Batch: WG1836224-2 WG1836224-3									
Aroclor 1016	75		71		40-140	5		30	A
Aroclor 1260	74		71		40-140	4		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	78		72		30-150	A
Decachlorobiphenyl	77		74		30-150	A
2,4,5,6-Tetrachloro-m-xylene	78		72		30-150	B
Decachlorobiphenyl	78		74		30-150	B

PESTICIDES

Project Name: ANDOVER LANDFILL
Lab Number: L2358905
Project Number: Not Specified
Report Date: 10/16/23

SAMPLE RESULTS

Lab ID: L2358905-01
Client ID: CONCORD NH LOAM
Sample Location: ANDOVER, MA

Date Collected: 10/05/23 10:00
Date Received: 10/05/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8081B
Analytical Date: 10/06/23 14:17
Analyst: JAG
Percent Solids: 83%

Extraction Method: EPA 3546
Extraction Date: 10/05/23 21:03
Cleanup Method: EPA 3620B
Cleanup Date: 10/06/23
Cleanup Method: EPA 3660B
Cleanup Date: 10/06/23

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Organochlorine Pesticides - Westborough Lab							
Delta-BHC	ND		ug/kg	1.89	--	1	A
Lindane	ND		ug/kg	0.630	--	1	A
Alpha-BHC	ND		ug/kg	0.788	--	1	A
Beta-BHC	ND		ug/kg	1.89	--	1	A
Heptachlor	ND		ug/kg	0.946	--	1	A
Aldrin	ND		ug/kg	1.89	--	1	A
Heptachlor epoxide	ND		ug/kg	3.55	--	1	B
Endrin	ND		ug/kg	0.788	--	1	A
Endrin ketone	ND		ug/kg	1.89	--	1	A
Dieldrin	ND		ug/kg	1.18	--	1	A
4,4'-DDE	71.4		ug/kg	1.89	--	1	A
4,4'-DDD	4.63		ug/kg	1.89	--	1	A
4,4'-DDT	51.1		ug/kg	3.55	--	1	A
Endosulfan I	ND		ug/kg	1.89	--	1	A
Endosulfan II	ND		ug/kg	1.89	--	1	A
Endosulfan sulfate	ND		ug/kg	0.788	--	1	A
Methoxychlor	ND		ug/kg	3.55	--	1	A
Chlordane	23.0		ug/kg	15.8	--	1	A
Hexachlorobenzene	ND		ug/kg	1.89	--	1	A
Toxaphene	ND		ug/kg	35.5	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	53		30-150	A
Decachlorobiphenyl	53		30-150	A
2,4,5,6-Tetrachloro-m-xylene	56		30-150	B
Decachlorobiphenyl	52		30-150	B

Project Name: ANDOVER LANDFILL
Lab Number: L2358905
Project Number: Not Specified
Report Date: 10/16/23

SAMPLE RESULTS

Lab ID: L2358905-01
Client ID: CONCORD NH LOAM
Sample Location: ANDOVER, MA

Date Collected: 10/05/23 10:00
Date Received: 10/05/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 97,8151A
Analytical Date: 10/08/23 14:44
Analyst: EJL
Percent Solids: 83%
Methylation Date: 10/06/23 18:29

Extraction Method: EPA 8151A
Extraction Date: 10/05/23 20:06

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Chlorinated Herbicides - Westborough Lab							
MCPP	ND		ug/kg	3900	--	1	A
MCPA	ND		ug/kg	3900	--	1	A
Dalapon	ND		ug/kg	39	--	1	A
Dicamba	ND		ug/kg	39	--	1	A
Dichloroprop	ND		ug/kg	39	--	1	A
2,4-D	ND		ug/kg	39	--	1	A
2,4-DB	ND		ug/kg	39	--	1	A
2,4,5-T	ND		ug/kg	39	--	1	A
2,4,5-TP (Silvex)	ND		ug/kg	39	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DCAA	90		30-150	A
DCAA	84		30-150	B

Project Name: ANDOVER LANDFILL
Project Number: Not Specified
Lab Number: L2358905
Report Date: 10/16/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8151A
Analytical Date: 10/08/23 12:37
Analyst: EJL

Extraction Method: EPA 8151A
Extraction Date: 10/05/23 20:06

Methylation Date: 10/06/23 18:29

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Chlorinated Herbicides - Westborough Lab for sample(s): 01 Batch: WG1836204-1						
MCPP	ND		ug/kg	3300	--	A
MCPA	ND		ug/kg	3300	--	A
Dalapon	ND		ug/kg	33	--	A
Dicamba	ND		ug/kg	33	--	A
Dichloroprop	ND		ug/kg	33	--	A
2,4-D	ND		ug/kg	33	--	A
2,4-DB	ND		ug/kg	33	--	A
2,4,5-T	ND		ug/kg	33	--	A
2,4,5-TP (Silvex)	ND		ug/kg	33	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
DCAA	79		30-150	A
DCAA	75		30-150	B

Project Name: ANDOVER LANDFILL
Project Number: Not Specified
Lab Number: L2358905
Report Date: 10/16/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8081B
Analytical Date: 10/06/23 13:27
Analyst: JAG

Extraction Method: EPA 3546
Extraction Date: 10/05/23 21:03
Cleanup Method: EPA 3620B
Cleanup Date: 10/06/23
Cleanup Method: EPA 3660B
Cleanup Date: 10/06/23

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Organochlorine Pesticides - Westborough Lab for sample(s): 01 Batch: WG1836220-1						
Delta-BHC	ND		ug/kg	1.51	--	A
Lindane	ND		ug/kg	0.504	--	A
Alpha-BHC	ND		ug/kg	0.630	--	A
Beta-BHC	ND		ug/kg	1.51	--	A
Heptachlor	ND		ug/kg	0.757	--	A
Aldrin	ND		ug/kg	1.51	--	A
Heptachlor epoxide	ND		ug/kg	2.84	--	A
Endrin	ND		ug/kg	0.630	--	A
Endrin ketone	ND		ug/kg	1.51	--	A
Dieldrin	ND		ug/kg	0.946	--	A
4,4'-DDE	ND		ug/kg	1.51	--	A
4,4'-DDD	ND		ug/kg	1.51	--	A
4,4'-DDT	ND		ug/kg	2.84	--	A
Endosulfan I	ND		ug/kg	1.51	--	A
Endosulfan II	ND		ug/kg	1.51	--	A
Endosulfan sulfate	ND		ug/kg	0.630	--	A
Methoxychlor	ND		ug/kg	2.84	--	A
Chlordane	ND		ug/kg	12.6	--	A
Hexachlorobenzene	ND		ug/kg	1.51	--	A
Toxaphene	ND		ug/kg	28.4	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	69		30-150	A
Decachlorobiphenyl	73		30-150	A
2,4,5,6-Tetrachloro-m-xylene	76		30-150	B
Decachlorobiphenyl	69		30-150	B

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LANDFILL
Project Number: Not Specified

Lab Number: L2358905
Report Date: 10/16/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Chlorinated Herbicides - Westborough Lab Associated sample(s): 01 Batch: WG1836204-2 WG1836204-3									
MCPP	122		130		40-140	6		30	A
MCPA	91		95		40-140	4		30	A
Dalapon	62		64		40-140	3		30	A
Dicamba	77		81		40-140	5		30	A
Dichloroprop	78		82		40-140	5		30	A
2,4-D	75		79		40-140	5		30	A
2,4-DB	59		65		40-140	10		30	A
2,4,5-T	75		80		40-140	6		30	A
2,4,5-TP (Silvex)	75		78		40-140	4		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
DCAA	70		74		30-150	A
DCAA	70		75		30-150	B

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LANDFILL
Project Number: Not Specified

Lab Number: L2358905
Report Date: 10/16/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Organochlorine Pesticides - Westborough Lab Associated sample(s): 01 Batch: WG1836220-2 WG1836220-3									
Delta-BHC	89		92		40-140	3		30	A
Lindane	77		79		40-140	3		30	A
Alpha-BHC	79		82		40-140	4		30	A
Beta-BHC	83		86		40-140	4		30	A
Heptachlor	80		83		40-140	4		30	A
Aldrin	78		79		40-140	1		30	A
Heptachlor epoxide	72		73		40-140	1		30	A
Endrin	84		82		40-140	2		30	A
Endrin ketone	91		90		40-140	1		30	A
Dieldrin	88		87		40-140	1		30	A
4,4'-DDE	83		83		40-140	0		30	A
4,4'-DDD	90		89		40-140	1		30	A
4,4'-DDT	88		87		40-140	1		30	A
Endosulfan I	81		82		40-140	1		30	A
Endosulfan II	87		87		40-140	0		30	A
Endosulfan sulfate	81		80		40-140	1		30	A
Methoxychlor	103		103		40-140	0		30	A
Hexachlorobenzene	70		73		40-140	4		30	A

Lab Control Sample Analysis

Batch Quality Control

Project Name: ANDOVER LANDFILL
Project Number: Not Specified

Lab Number: L2358905
Report Date: 10/16/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Organochlorine Pesticides - Westborough Lab Associated sample(s): 01 Batch: WG1836220-2 WG1836220-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	69		73		30-150	A
Decachlorobiphenyl	75		76		30-150	A
2,4,5,6-Tetrachloro-m-xylene	71		79		30-150	B
Decachlorobiphenyl	68		67		30-150	B

METALS

Project Name: ANDOVER LANDFILL
Lab Number: L2358905
Project Number: Not Specified
Report Date: 10/16/23

SAMPLE RESULTS

Lab ID: L2358905-01
Client ID: CONCORD NH LOAM
Sample Location: ANDOVER, MA
Date Collected: 10/05/23 10:00
Date Received: 10/05/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Percent Solids: 83%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	2.34	--	1	10/06/23 09:40	10/06/23 20:54	EPA 3050B	97,6010D	JTS
Arsenic, Total	5.43		mg/kg	0.468	--	1	10/06/23 09:40	10/06/23 20:54	EPA 3050B	97,6010D	JTS
Barium, Total	34.3		mg/kg	0.468	--	1	10/06/23 09:40	10/06/23 20:54	EPA 3050B	97,6010D	JTS
Beryllium, Total	0.302		mg/kg	0.234	--	1	10/06/23 09:40	10/06/23 20:54	EPA 3050B	97,6010D	JTS
Cadmium, Total	ND		mg/kg	0.468	--	1	10/06/23 09:40	10/06/23 20:54	EPA 3050B	97,6010D	JTS
Chromium, Total	5.63		mg/kg	0.468	--	1	10/06/23 09:40	10/06/23 20:54	EPA 3050B	97,6010D	JTS
Lead, Total	28.5		mg/kg	2.34	--	1	10/06/23 09:40	10/06/23 20:54	EPA 3050B	97,6010D	JTS
Mercury, Total	ND		mg/kg	0.085	--	1	10/06/23 10:30	10/06/23 14:13	EPA 7471B	97,7471B	GMG
Nickel, Total	3.24		mg/kg	1.17	--	1	10/06/23 09:40	10/06/23 20:54	EPA 3050B	97,6010D	JTS
Selenium, Total	ND		mg/kg	2.34	--	1	10/06/23 09:40	10/06/23 20:54	EPA 3050B	97,6010D	JTS
Silver, Total	ND		mg/kg	0.468	--	1	10/06/23 09:40	10/06/23 20:54	EPA 3050B	97,6010D	JTS
Thallium, Total	ND		mg/kg	2.34	--	1	10/06/23 09:40	10/06/23 20:54	EPA 3050B	97,6010D	JTS
Vanadium, Total	8.64		mg/kg	0.468	--	1	10/06/23 09:40	10/06/23 20:54	EPA 3050B	97,6010D	JTS
Zinc, Total	38.2		mg/kg	2.34	--	1	10/06/23 09:40	10/06/23 20:54	EPA 3050B	97,6010D	JTS

Project Name: ANDOVER LANDFILL **Lab Number:** L2358905

Project Number: Not Specified **Report Date:** 10/16/23

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1836306-1										
Antimony, Total	ND		mg/kg	2.00	--	1	10/06/23 09:40	10/06/23 21:17	97,6010D	JTS
Arsenic, Total	ND		mg/kg	0.400	--	1	10/06/23 09:40	10/06/23 21:17	97,6010D	JTS
Barium, Total	ND		mg/kg	0.400	--	1	10/06/23 09:40	10/06/23 21:17	97,6010D	JTS
Beryllium, Total	ND		mg/kg	0.200	--	1	10/06/23 09:40	10/06/23 21:17	97,6010D	JTS
Cadmium, Total	ND		mg/kg	0.400	--	1	10/06/23 09:40	10/06/23 21:17	97,6010D	JTS
Chromium, Total	ND		mg/kg	0.400	--	1	10/06/23 09:40	10/06/23 21:17	97,6010D	JTS
Lead, Total	ND		mg/kg	2.00	--	1	10/06/23 09:40	10/06/23 21:17	97,6010D	JTS
Nickel, Total	ND		mg/kg	1.00	--	1	10/06/23 09:40	10/06/23 21:17	97,6010D	JTS
Selenium, Total	ND		mg/kg	2.00	--	1	10/06/23 09:40	10/06/23 21:17	97,6010D	JTS
Silver, Total	ND		mg/kg	0.400	--	1	10/06/23 09:40	10/06/23 21:17	97,6010D	JTS
Thallium, Total	ND		mg/kg	2.00	--	1	10/06/23 09:40	10/06/23 21:17	97,6010D	JTS
Vanadium, Total	ND		mg/kg	0.400	--	1	10/06/23 09:40	10/06/23 21:17	97,6010D	JTS
Zinc, Total	ND		mg/kg	2.00	--	1	10/06/23 09:40	10/06/23 21:17	97,6010D	JTS

Prep Information

Digestion Method: EPA 3050B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1836307-1										
Mercury, Total	ND		mg/kg	0.083	--	1	10/06/23 10:30	10/06/23 13:17	97,7471B	GMG

Prep Information

Digestion Method: EPA 7471B

Lab Control Sample Analysis

Batch Quality Control

Project Name: ANDOVER LANDFILL

Project Number: Not Specified

Lab Number: L2358905

Report Date: 10/16/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1836306-2 WG1836306-3 SRM Lot Number: D119-540								
Antimony, Total	145		153		10-190	5		30
Arsenic, Total	103		109		83-117	6		30
Barium, Total	91		94		82-118	3		30
Beryllium, Total	91		96		83-117	5		30
Cadmium, Total	86		92		82-117	7		30
Chromium, Total	91		99		82-119	8		30
Lead, Total	100		104		82-118	4		30
Nickel, Total	89		96		82-117	8		30
Selenium, Total	103		109		79-121	6		30
Silver, Total	101		106		80-120	5		30
Thallium, Total	101		106		81-119	5		30
Vanadium, Total	90		95		79-121	5		30
Zinc, Total	97		101		80-120	4		30
MCP Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1836307-2 WG1836307-3 SRM Lot Number: D119-540								
Mercury, Total	90		93		73-127	3		30

INORGANICS
&
MISCELLANEOUS

Project Name: ANDOVER LANDFILL
Project Number: Not Specified

Lab Number: L2358905
Report Date: 10/16/23

SAMPLE RESULTS

Lab ID: L2358905-01
Client ID: CONCORD NH LOAM
Sample Location: ANDOVER, MA

Date Collected: 10/05/23 10:00
Date Received: 10/05/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	83.1		%	0.100	NA	1	-	10/05/23 21:30	121,2540G	WJM

Project Name: ANDOVER LANDFILL
Project Number: Not Specified

Lab Number: L2358905
Report Date: 10/16/23

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2358905-01A	Vial MeOH preserved	A	NA		25.5	Y	Absent		MCP-8260HLW-21(14)
L2358905-01B	Vial water preserved	A	NA		25.5	Y	Absent	05-OCT-23 20:10	MCP-8260HLW-21(14)
L2358905-01C	Vial water preserved	A	NA		25.5	Y	Absent	05-OCT-23 20:10	MCP-8260HLW-21(14)
L2358905-01D	Plastic 2oz unpreserved for TS	A	NA		25.5	Y	Absent		TS(7)
L2358905-01E	Metals Only-Glass 60mL/2oz unpreserved	A	NA		25.5	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-TL-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-ZN-6010T-10(180),MCP-BE-6010T-10(180),MCP-SE-6010T-10(180),MCP-V-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180),MCP-NI-6010T-10(180)
L2358905-01F	Glass 500ml/16oz unpreserved	A	NA		25.5	Y	Absent		MCP-8082-10(365),MCP-8081-10(14),MCP-8151-10(14),MCP-8270-21(14)

*Values in parentheses indicate holding time in days

Project Name:	ANDOVER LANDFILL	**Lab Number:**	L2358905
Project Number:	Not Specified	**Report Date:**	10/16/23

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name:	ANDOVER LANDFILL	**Lab Number:**	L2358905
Project Number:	Not Specified	**Report Date:**	10/16/23

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report

Project Name:	ANDOVER LANDFILL	**Lab Number:**	L2358905
Project Number:	Not Specified	**Report Date:**	10/16/23

Data Qualifiers

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: Data Usability Report

Project Name:	ANDOVER LANDFILL	**Lab Number:**	L2358905
Project Number:	Not Specified	**Report Date:**	10/16/23

REFERENCES

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

141 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA and IIB, November 2021.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE _____ OF _____

Date Rec'd in Lab: 10-5-2023

ALPHA Job #: L2358905

ALPHA ANALYTICAL
8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220
320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Client Information

Client: J Bates and Son
Address: 57 Lawrence St.
Clinton, MA 01510
Phone: 978-368-7001
Email: smcnally@jbatesandson.com

Project Information

Project Name: Andover LF
Project Location: Andover MA
Project #:
Project Manager: Jennifer Byrnes
ALPHA Quote #:

Report Information - Data Deliverables

☐ ADEx ☑ EMAIL

Billing Information

☑ Same as Client info PO #: Andover

Turn-Around Time

☑ Standard ☐ RUSH (only confirmed if pre-approved)
Date Due:

Regulatory Requirements & Project Information Requirements

☑ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods
☐ Yes ☐ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☐ No NPDES RGP
☐ Other State /Fed Program _____ Criteria _____

Additional Project Information:

* See Bottle Order # 439507

ANALYSIS

VOC: ☐ 8260 ☐ 624 ☐ 524.2
SVOC: ☐ ABN ☐ PAH
METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15
METALS: ☐ RCRA5 ☐ RCRA8
EPH: ☐ Ranges & Targets ☐ Ranges Only
VPH: ☐ Ranges & Targets ☐ Ranges Only
☐ PCB ☐ PEST
TPH: ☐ Quant Only ☐ Fingerprint

SAMPLE INFO
Filtration
☐ Field
☐ Lab to do
Preservation
☐ Lab to do

Sample Comments

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials
58905 -01	Concord NH loam	10/5/23	10:00		SM

Container Type
Preservative

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H = $Na_2S_2O_3$
I= Ascorbic Acid
J = NH_4Cl
K= Zn Acetate
O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
Seth McNally	10/5/23 2:44		10/5/23 1444

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

L2358905

Bottle Order Request

Bottle Order # 439507

OCT-02-23 14:46:26

Acctnum : *JBATES* **Company :** *J. Bates & Son, LLC*
Contact Name : *Seth McNally* **Client PM :**
Projectnum : **Projectname :**

Request date : *10/02/23* **Status :** *NEED* **Sample delivery date :**
Order taken by : *Mark Oliver* **Linked Call :** **Projected TAT :**

Completed by : **Delivery method :** *P/U Flanders pm*
Date Completed :

Matrix : *SOIL* **# Samples :** *2* **Client IDs :** 1

Analytes : *Total Solids - SM 2540*
MCP 8081B - Organochlorine Pesticides
MCP 5035/8260D VOCs - High & Low Level **0 Trip Blanks**
MCP 8270E - Semivolatile Organics
MCP 8151A - Chlorinated Herbicides
MCP 8082A - Polychlorinated Biphenyls
MCP 6010D/7470A - Total MCP 14 Metals

ontainer	Quantity	Analyte Label
lass 500ml/16oz unpreserved	1	MCP-8270-21 MCP-8081-10 MCP-8082-10 MCP-8151-10
etals Only-Glass 60mL/2oz unpr	1	MCP14
astic 2oz unpreserved for TS	1	TS
mL Syringe for VOA	1	
al MeOH preserved	1	MCP-8260HLW-21 (High)
al water preserved	2	MCP-8260HLW-21 (Low)

Client IDs : 1

ttle Quantity Summary:

L Syringe for VOA	2
ss 500ml/16oz unpreserved	2
als Only-Glass 60mL/2oz unpr	2
tic 2oz unpreserved for TS	2
MeOH preserved	2
water preserved	4

Blanks and Miscellaneous Field Blanks:

Special Shipping Requirements

ooler [X]	Dangerous	Certified	NJ Courier Pickup Label	Return Shipping Labels

Pending Shipping Date(s)
10/03/23

PLEASE PUT SAMPLES ON ICE
EXCEPT CANISTER OR BAG SAMPLES

Link to Alpha Sampling Reference Guide

L2358905

Bottle Order Request

Bottle Order # 439507

OCT-02-23 14:46:26

okl

you have questions on this Bottle Order, need to order additional bottles or schedule a Sample ickup, please call a member of our Alpha team at 508-898-9220.

OCT-02-23 14:46:26
Page 2 of 2

PLEASE PUT SAMPLES ON ICE
EXCEPT CANISTER OR BAG SAMPLES

Link to Alpha Sampling Reference Guide

Method Blank Summary
Form 4
Volatiles

Client	: J. Bates & Son, LLC	**Lab Number**	: L2358905
Project Name	: ANDOVER LANDFILL	**Project Number**	:
Lab Sample ID	: WG1837380-5	**Lab File ID**	: V10231009A05
Instrument ID	: VOA110		
Matrix	: SOIL	**Analysis Date**	: 10/09/23 09:43

Client Sample No.	Lab Sample ID	Analysis Date
WG1837380-3LCS	WG1837380-3	10/09/23 08:22
WG1837380-4LCSD	WG1837380-4	10/09/23 08:49
CONCORD NH LOAM	L2358905-01	10/09/23 13:48

Calibration Verification Summary
Form 7
Volatiles

Client	: J. Bates & Son, LLC	**Lab Number**	: L2358905
Project Name	: ANDOVER LANDFILL	**Project Number**	:
Instrument ID	: VOA110	**Calibration Date**	: 10/09/23 07:55
Lab File ID	: V10231009A01	**Init. Calib. Date(s)**	: 09/18/23 09/18/23
Sample No	: WG1837380-2	**Init. Calib. Times**	: 14:10 18:42
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
Fluorobenzene	1	1	-	0	20	84	0
Dichlorodifluoromethane	0.346	0.282	-	18.5	20	71	0
Chloromethane	0.41	0.425	-	-3.7	20	89	0
Vinyl chloride	0.348	0.338	-	2.9	20	81	0
Bromomethane	0.211	0.177	-	16.1	20	74	0
Chloroethane	0.222	0.21	-	5.4	20	80	0
Trichlorofluoromethane	0.364	0.339	-	6.9	20	80	0
Ethyl ether	0.184	0.16	-	13	20	71	0
1,1-Dichloroethene	0.246	0.216	-	12.2	20	74	0
Carbon disulfide	0.934	0.779	-	16.6	20	76	0
Freon-113	0.257	0.23	-	10.5	20	75	0
Acrolein	0.057	0.065	-	-14	20	93	0
Methylene chloride	0.286	0.264	-	7.7	20	76	0
Acetone	40	42.019	-	-5	20	90	0
trans-1,2-Dichloroethene	0.279	0.251	-	10	20	75	0
Methyl acetate	0.316	0.347	-	-9.8	20	84	0
Methyl tert-butyl ether	0.996	0.836	-	16.1	20	66	0
tert-Butyl alcohol	0.056	0.054	-	3.6	20	77	0
Diisopropyl ether	1.18	1.322	-	-12	20	87	0
1,1-Dichloroethane	0.554	0.559	-	-0.9	20	82	0
Halothane	0.217	0.198	-	8.8	20	76	0
Acrylonitrile	0.134	0.126	-	6	20	81	0
Ethyl tert-butyl ether	1.07	1.068	-	0.2	20	76	0
Vinyl acetate	0.728	0.896	-	-23.1*	20	97	0
cis-1,2-Dichloroethene	0.322	0.294	-	8.7	20	76	0
2,2-Dichloropropane	0.447	0.407	-	8.9	20	78	0
Bromochloromethane	0.149	0.139	-	6.7	20	75	0
Cyclohexane	0.559	0.544	-	2.7	20	82	0
Chloroform	0.487	0.478	-	1.8	20	78	0
Ethyl acetate	0.413	0.457	-	-10.7	20	86	0
Carbon tetrachloride	40	32.261	-	19.3	20	75	0
Tetrahydrofuran	0.131	0.129	-	1.5	20	82	0
Dibromofluoromethane	0.286	0.268	-	6.3	20	80	0
1,1,1-Trichloroethane	0.457	0.389	-	14.9	20	75	0
2-Butanone	0.191	0.201	-	-5.2	20	88	0
1,1-Dichloropropene	0.397	0.361	-	9.1	20	78	0
Benzene	1.152	1.129	-	2	20	81	0
tert-Amyl methyl ether	0.94	0.871	-	7.3	20	72	0
1,2-Dichloroethane-d4	0.348	0.34	-	2.3	20	84	0
1,2-Dichloroethane	0.431	0.425	-	1.4	20	78	0
Methyl cyclohexane	0.519	0.443	-	14.6	20	70	0
Trichloroethene	40	36.735	-	8.2	20	76	0
Dibromomethane	0.181	0.175	-	3.3	20	78	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: J. Bates & Son, LLC	**Lab Number**	: L2358905
Project Name	: ANDOVER LANDFILL	**Project Number**	:
Instrument ID	: VOA110	**Calibration Date**	: 10/09/23 07:55
Lab File ID	: V10231009A01	**Init. Calib. Date(s)**	: 09/18/23 09/18/23
Sample No	: WG1837380-2	**Init. Calib. Times**	: 14:10 18:42
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
1,2-Dichloropropane	0.313	0.316	-	-1	20	81	0
2-Chloroethyl vinyl ether	0.203	0.169	-	16.7	20	62	0
Bromodichloromethane	40	38.839	-	2.9	20	77	0
1,4-Dioxane	0.00387	0.00349*	-	9.8	20	72	0
cis-1,3-Dichloropropene	0.501	0.482	-	3.8	20	76	0
Chlorobenzene-d5	1	1	-	0	20	71	0
Toluene-d8	1.18	1.306	-	-10.7	20	79	0
Toluene	0.758	0.82	-	-8.2	20	76	0
4-Methyl-2-pentanone	0.15	0.163	-	-8.7	20	76	0
Tetrachloroethene	0.3	0.305	-	-1.7	20	70	0
trans-1,3-Dichloropropene	0.469	0.546	-	-16.4	20	77	0
Ethyl methacrylate	0.404	0.415	-	-2.7	20	65	0
1,1,2-Trichloroethane	0.239	0.272	-	-13.8	20	81	0
Chlorodibromomethane	0.315	0.342	-	-8.6	20	73	0
1,3-Dichloropropane	0.459	0.558	-	-21.6*	20	79	0
1,2-Dibromoethane	0.275	0.313	-	-13.8	20	74	0
2-Hexanone	0.294	0.34	-	-15.6	20	77	0
Chlorobenzene	0.838	0.897	-	-7	20	74	0
Ethylbenzene	1.442	1.578	-	-9.4	20	76	0
1,1,1,2-Tetrachloroethane	0.304	0.33	-	-8.6	20	72	0
p/m Xylene	80	88.375	-	-10.5	20	75	0
o Xylene	0.573	0.609	-	-6.3	20	75	0
Styrene	0.954	1.086	-	-13.8	20	76	0
1,4-Dichlorobenzene-d4	1	1	-	0	20	69	0
Bromoform	0.35	0.393	-	-12.3	20	71	0
Isopropylbenzene	2.459	2.796	-	-13.7	20	74	0
4-Bromofluorobenzene	0.837	0.863	-	-3.1	20	71	0
Bromobenzene	0.618	0.692	-	-12	20	72	0
n-Propylbenzene	2.868	3.418	-	-19.2	20	77	0
1,4-Dichlorobutane	0.945	1.124	-	-18.9	20	76	0
1,1,2,2-Tetrachloroethane	0.673	0.865	-	-28.5*	20	87	0
4-Ethyltoluene	2.505	2.877	-	-14.9	20	75	0
2-Chlorotoluene	1.696	2.062	-	-21.6*	20	78	0
1,3,5-Trimethylbenzene	2.118	2.451	-	-15.7	20	76	0
1,2,3-Trichloropropane	0.534	0.672	-	-25.8*	20	82	0
trans-1,4-Dichloro-2-buten	0.254	0.298	-	-17.3	20	77	0
4-Chlorotoluene	1.787	2.166	-	-21.2*	20	78	0
tert-Butylbenzene	1.822	2.071	-	-13.7	20	73	0
1,2,4-Trimethylbenzene	2.106	2.437	-	-15.7	20	76	0
sec-Butylbenzene	2.693	3.155	-	-17.2	20	74	0
p-Isopropyltoluene	2.403	2.711	-	-12.8	20	72	0
1,3-Dichlorobenzene	1.184	1.41	-	-19.1	20	76	0
1,4-Dichlorobenzene	1.218	1.427	-	-17.2	20	76	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: J. Bates & Son, LLC		**Lab Number**	: L2358905	
Project Name	: ANDOVER LANDFILL		**Project Number**	:	
Instrument ID	: VOA110		**Calibration Date**	: 10/09/23 07:55	
Lab File ID	: V10231009A01		**Init. Calib. Date(s)**	: 09/18/23	09/18/23
Sample No	: WG1837380-2		**Init. Calib. Times**	: 14:10	18:42
Channel	:				

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
p-Diethylbenzene	1.466	1.657	-	-13	20	72	0
n-Butylbenzene	2.023	2.512	-	-24.2*	20	78	0
1,2-Dichlorobenzene	1.147	1.358	-	-18.4	20	75	0
1,2,4,5-Tetramethylbenzene	2.337	2.611	-	-11.7	20	71	0
1,2-Dibromo-3-chloropropan	0.126	0.138	-	-9.5	20	70	0
1,3,5-Trichlorobenzene	0.867	0.994	-	-14.6	20	73	0
Hexachlorobutadiene	0.386	0.379	-	1.8	20	62	0
1,2,4-Trichlorobenzene	0.79	0.896	-	-13.4	20	73	0
Naphthalene	2.316	2.664	-	-15	20	74	0
1,2,3-Trichlorobenzene	0.76	0.88	-	-15.8	20	74	0

* Value outside of QC limits.

Performance Evaluation Mixture Summary
Form 15
Pesticides

Client	: J. Bates & Son, LLC	**Lab Number**	: L2358905
Project Name	: ANDOVER LANDFILL	**Project Number**	:
Instrument ID	: PEST20	**Analysis Date**	: 10/06/23 10:23
PEM Standard	: R1749348-1		
Column 1	: RTX-5	**Column 2**	: RTX-CLPPesticides2

Parameter	Signal 1	Signal 2
4,4'-DDE	2721260.11922	242266.14144
Endrin	162672179.0467	122943006.16306
4,4'-DDD	1239559.8221	1220068.80442
4,4'-DDT	263804189.90456	188986505.31042
Endrin Aldehyde	0	413674.7127
Endrin Ketone	1196416.04034	750180.78879

Parameter	%Breakdown 1	%Breakdown 2
Endrin	0.730	0.938
DDT	1.48	0.768

ANALYTICAL REPORT

Lab Number:	L2417324
Client:	J. Bates & Son, LLC P.O Box 997 Clinton, MA 01510
ATTN:	Seth Mcnally
Phone:	(978) 368-7001
Project Name:	ANDOVER LF
Project Number:	Not Specified
Report Date:	04/03/24

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0826), IL (200077), IN (C-MA-03), KY (KY98045), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), OH (CL108), OR (MA-1316), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #525-23-122-91930).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2417324
Report Date: 04/03/24

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2417324-01	TEWKS LOAM	SOLID	ANDOVER, MA	03/29/24 10:00	03/29/24

Project Name:	ANDOVER LF	**Lab Number:**	L2417324
Project Number:	Not Specified	**Report Date:**	04/03/24

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	YES

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name:	ANDOVER LF	**Lab Number:**	L2417324
Project Number:	Not Specified	**Report Date:**	04/03/24

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2417324
Report Date: 04/03/24

Case Narrative (continued)

MCP Related Narratives

Sample Receipt

The analyses performed were specified by the client.

In reference to question H:

A Matrix Spike was not submitted for the analysis of Total Metals.

Volatile Organics

L2417324-01: The sample was analyzed as a High Level Methanol in order to quantitate results within the calibration range. The result should be considered estimated, and is qualified with an E flag, for any compound that exceeded the calibration on the initial Low Level analysis. The results of both analyses are reported.

L2417324-01: A copy of the continuing calibration standard is included as an addendum to this report.

In reference to question H:

L2417324-01: Initial Calibration did not meet:

Lowest Calibration Standard Minimum Response Factor: 1,2-dichloropropane (0.1957), bromodichloromethane (0.2593), cis-1,3-dichloropropene (0.2854), trans-1,3-dichloropropene (0.2897), 1,1,2-trichloroethane (0.1383), 1,2-dibromoethane (0.1811)

Average Response Factor: bromodichloromethane, 1,1,2-trichloroethane

Verification: dichlorodifluoromethane (131%), carbon disulfide (67%)

Total Metals

L2417324-01: The sample has elevated detection limits for all elements, with the exception of mercury, due to the dilution required by the sample matrix.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Melissa Sturgis Melissa Sturgis

Title: Technical Director/Representative Date: 04/03/24

QC OUTLIER SUMMARY REPORT

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2417324
Report Date: 04/03/24

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment
MCP Semivolatile Organics - Westborough Lab								
8270E	TEWKS LOAM	L2417324-01	2,4,6-Tribromophenol	Surrogate	29	30-130	-	potential low bias
8270E	Batch QC	WG1902890-2	2,4-Dinitrophenol	LCS	10	30-130	01	potential low bias
8270E	Batch QC	WG1902890-3	Aniline	LCSD	37	40-140	01	potential low bias
8270E	Batch QC	WG1902890-3	2,4-Dinitrophenol	LCSD	11	30-130	01	potential low bias

ORGANICS

VOLATILES

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2417324
Report Date: 04/03/24

SAMPLE RESULTS

Lab ID: L2417324-01
Client ID: TEWKS LOAM
Sample Location: ANDOVER, MA
Date Collected: 03/29/24 10:00
Date Received: 03/29/24
Field Prep: Not Specified

Sample Depth:
Matrix: Solid
Analytical Method: 141,8260D
Analytical Date: 04/01/24 14:59
Analyst: JIC
Percent Solids: 78%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Methylene chloride	ND		ug/kg	4.8	--	1
1,1-Dichloroethane	ND		ug/kg	0.96	--	1
Chloroform	ND		ug/kg	1.4	--	1
Carbon tetrachloride	ND		ug/kg	0.96	--	1
1,2-Dichloropropane	ND		ug/kg	0.96	--	1
Dibromochloromethane	ND		ug/kg	0.96	--	1
1,1,2-Trichloroethane	ND		ug/kg	0.96	--	1
Tetrachloroethene	27		ug/kg	0.48	--	1
Chlorobenzene	ND		ug/kg	0.48	--	1
Trichlorofluoromethane	ND		ug/kg	3.8	--	1
1,2-Dichloroethane	ND		ug/kg	0.96	--	1
1,1,1-Trichloroethane	ND		ug/kg	0.48	--	1
Bromodichloromethane	ND		ug/kg	0.48	--	1
trans-1,3-Dichloropropene	ND		ug/kg	0.96	--	1
cis-1,3-Dichloropropene	ND		ug/kg	0.48	--	1
1,3-Dichloropropene, Total	ND		ug/kg	0.48	--	1
1,1-Dichloropropene	ND		ug/kg	0.48	--	1
Bromoform	ND		ug/kg	3.8	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.48	--	1
Benzene	ND		ug/kg	0.48	--	1
Toluene	2.0		ug/kg	0.96	--	1
Ethylbenzene	ND		ug/kg	0.96	--	1
Chloromethane	ND		ug/kg	3.8	--	1
Bromomethane	ND		ug/kg	1.9	--	1
Vinyl chloride	ND		ug/kg	0.96	--	1
Chloroethane	ND		ug/kg	1.9	--	1
1,1-Dichloroethene	ND		ug/kg	0.96	--	1
trans-1,2-Dichloroethene	ND		ug/kg	1.4	--	1

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2417324
Report Date: 04/03/24

SAMPLE RESULTS

Lab ID: L2417324-01
Client ID: TEWKS LOAM
Sample Location: ANDOVER, MA
Date Collected: 03/29/24 10:00
Date Received: 03/29/24
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
Trichloroethene	ND		ug/kg	0.48	--	1
1,2-Dichlorobenzene	ND		ug/kg	1.9	--	1
1,3-Dichlorobenzene	ND		ug/kg	1.9	--	1
1,4-Dichlorobenzene	ND		ug/kg	1.9	--	1
Methyl tert butyl ether	ND		ug/kg	1.9	--	1
p/m-Xylene	ND		ug/kg	1.9	--	1
o-Xylene	ND		ug/kg	0.96	--	1
Xylenes, Total	ND		ug/kg	0.96	--	1
cis-1,2-Dichloroethene	ND		ug/kg	0.96	--	1
1,2-Dichloroethene, Total	ND		ug/kg	0.96	--	1
Dibromomethane	ND		ug/kg	1.9	--	1
1,2,3-Trichloropropane	ND		ug/kg	1.9	--	1
Styrene	ND		ug/kg	0.96	--	1
Dichlorodifluoromethane	ND		ug/kg	9.6	--	1
Acetone	960	E	ug/kg	24	--	1
Carbon disulfide	ND		ug/kg	9.6	--	1
Methyl ethyl ketone	ND		ug/kg	9.6	--	1
Methyl isobutyl ketone	ND		ug/kg	9.6	--	1
2-Hexanone	ND		ug/kg	9.6	--	1
Bromochloromethane	ND		ug/kg	1.9	--	1
Tetrahydrofuran	ND		ug/kg	3.8	--	1
2,2-Dichloropropane	ND		ug/kg	1.9	--	1
1,2-Dibromoethane	ND		ug/kg	0.96	--	1
1,3-Dichloropropane	ND		ug/kg	1.9	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	0.48	--	1
Bromobenzene	ND		ug/kg	1.9	--	1
n-Butylbenzene	ND		ug/kg	0.96	--	1
sec-Butylbenzene	ND		ug/kg	0.96	--	1
tert-Butylbenzene	ND		ug/kg	1.9	--	1
o-Chlorotoluene	ND		ug/kg	1.9	--	1
p-Chlorotoluene	ND		ug/kg	1.9	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	2.9	--	1
Hexachlorobutadiene	ND		ug/kg	3.8	--	1
Isopropylbenzene	ND		ug/kg	0.96	--	1
p-Isopropyltoluene	ND		ug/kg	0.96	--	1
Naphthalene	ND		ug/kg	3.8	--	1
n-Propylbenzene	ND		ug/kg	0.96	--	1

Project Name: ANDOVER LF
Lab Number: L2417324
Project Number: Not Specified
Report Date: 04/03/24

SAMPLE RESULTS

Lab ID: L2417324-01
Client ID: TEWKS LOAM
Sample Location: ANDOVER, MA
Date Collected: 03/29/24 10:00
Date Received: 03/29/24
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 Low - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	1.9	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	1.9	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	1.9	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	1.9	--	1
Diethyl ether	ND		ug/kg	1.9	--	1
Diisopropyl Ether	ND		ug/kg	1.9	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	1.9	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	1.9	--	1
1,4-Dioxane	ND		ug/kg	77	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	116		70-130
Toluene-d8	101		70-130
4-Bromofluorobenzene	115		70-130
Dibromofluoromethane	105		70-130

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2417324
Report Date: 04/03/24

SAMPLE RESULTS

Lab ID: L2417324-01
Client ID: TEWKS LOAM
Sample Location: ANDOVER, MA
Date Collected: 03/29/24 10:00
Date Received: 03/29/24
Field Prep: Not Specified

Sample Depth:
Matrix: Solid
Analytical Method: 141,8260D
Analytical Date: 04/01/24 15:26
Analyst: JIC
Percent Solids: 78%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 High - Westborough Lab						
Methylene chloride	ND		ug/kg	360	--	1
1,1-Dichloroethane	ND		ug/kg	72	--	1
Chloroform	ND		ug/kg	110	--	1
Carbon tetrachloride	ND		ug/kg	72	--	1
1,2-Dichloropropane	ND		ug/kg	72	--	1
Dibromochloromethane	ND		ug/kg	72	--	1
1,1,2-Trichloroethane	ND		ug/kg	72	--	1
Tetrachloroethene	92		ug/kg	36	--	1
Chlorobenzene	ND		ug/kg	36	--	1
Trichlorofluoromethane	ND		ug/kg	290	--	1
1,2-Dichloroethane	ND		ug/kg	72	--	1
1,1,1-Trichloroethane	ND		ug/kg	36	--	1
Bromodichloromethane	ND		ug/kg	36	--	1
trans-1,3-Dichloropropene	ND		ug/kg	72	--	1
cis-1,3-Dichloropropene	ND		ug/kg	36	--	1
1,3-Dichloropropene, Total	ND		ug/kg	36	--	1
1,1-Dichloropropene	ND		ug/kg	36	--	1
Bromoform	ND		ug/kg	290	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	36	--	1
Benzene	ND		ug/kg	36	--	1
Toluene	ND		ug/kg	72	--	1
Ethylbenzene	ND		ug/kg	72	--	1
Chloromethane	ND		ug/kg	290	--	1
Bromomethane	ND		ug/kg	140	--	1
Vinyl chloride	ND		ug/kg	72	--	1
Chloroethane	ND		ug/kg	140	--	1
1,1-Dichloroethene	ND		ug/kg	72	--	1
trans-1,2-Dichloroethene	ND		ug/kg	110	--	1

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2417324
Report Date: 04/03/24

SAMPLE RESULTS

Lab ID: L2417324-01
Client ID: TEWKS LOAM
Sample Location: ANDOVER, MA
Date Collected: 03/29/24 10:00
Date Received: 03/29/24
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 High - Westborough Lab						
Trichloroethene	ND		ug/kg	36	--	1
1,2-Dichlorobenzene	ND		ug/kg	140	--	1
1,3-Dichlorobenzene	ND		ug/kg	140	--	1
1,4-Dichlorobenzene	ND		ug/kg	140	--	1
Methyl tert butyl ether	ND		ug/kg	140	--	1
p/m-Xylene	ND		ug/kg	140	--	1
o-Xylene	ND		ug/kg	72	--	1
Xylenes, Total	ND		ug/kg	72	--	1
cis-1,2-Dichloroethene	ND		ug/kg	72	--	1
1,2-Dichloroethene, Total	ND		ug/kg	72	--	1
Dibromomethane	ND		ug/kg	140	--	1
1,2,3-Trichloropropane	ND		ug/kg	140	--	1
Styrene	ND		ug/kg	72	--	1
Dichlorodifluoromethane	ND		ug/kg	720	--	1
Acetone	ND		ug/kg	720	--	1
Carbon disulfide	ND		ug/kg	720	--	1
Methyl ethyl ketone	ND		ug/kg	720	--	1
Methyl isobutyl ketone	ND		ug/kg	720	--	1
2-Hexanone	ND		ug/kg	720	--	1
Bromochloromethane	ND		ug/kg	140	--	1
Tetrahydrofuran	ND		ug/kg	290	--	1
2,2-Dichloropropane	ND		ug/kg	140	--	1
1,2-Dibromoethane	ND		ug/kg	72	--	1
1,3-Dichloropropane	ND		ug/kg	140	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	36	--	1
Bromobenzene	ND		ug/kg	140	--	1
n-Butylbenzene	ND		ug/kg	72	--	1
sec-Butylbenzene	ND		ug/kg	72	--	1
tert-Butylbenzene	ND		ug/kg	140	--	1
o-Chlorotoluene	ND		ug/kg	140	--	1
p-Chlorotoluene	ND		ug/kg	140	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	220	--	1
Hexachlorobutadiene	ND		ug/kg	290	--	1
Isopropylbenzene	ND		ug/kg	72	--	1
p-Isopropyltoluene	ND		ug/kg	72	--	1
Naphthalene	ND		ug/kg	290	--	1
n-Propylbenzene	ND		ug/kg	72	--	1

Project Name: ANDOVER LF
Lab Number: L2417324
Project Number: Not Specified
Report Date: 04/03/24

SAMPLE RESULTS

Lab ID: L2417324-01
Client ID: TEWKS LOAM
Sample Location: ANDOVER, MA
Date Collected: 03/29/24 10:00
Date Received: 03/29/24
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 High - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	140	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	140	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	140	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	140	--	1
Diethyl ether	ND		ug/kg	140	--	1
Diisopropyl Ether	ND		ug/kg	140	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	140	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	140	--	1
1,4-Dioxane	ND		ug/kg	5700	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	111		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	98		70-130
Dibromofluoromethane	98		70-130

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2417324
Report Date: 04/03/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 04/01/24 09:43
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1903802-5					
Methylene chloride	ND		ug/kg	5.0	--
1,1-Dichloroethane	ND		ug/kg	1.0	--
Chloroform	ND		ug/kg	1.5	--
Carbon tetrachloride	ND		ug/kg	1.0	--
1,2-Dichloropropane	ND		ug/kg	1.0	--
Dibromochloromethane	ND		ug/kg	1.0	--
1,1,2-Trichloroethane	ND		ug/kg	1.0	--
Tetrachloroethene	ND		ug/kg	0.50	--
Chlorobenzene	ND		ug/kg	0.50	--
Trichlorofluoromethane	ND		ug/kg	4.0	--
1,2-Dichloroethane	ND		ug/kg	1.0	--
1,1,1-Trichloroethane	ND		ug/kg	0.50	--
Bromodichloromethane	ND		ug/kg	0.50	--
trans-1,3-Dichloropropene	ND		ug/kg	1.0	--
cis-1,3-Dichloropropene	ND		ug/kg	0.50	--
1,3-Dichloropropene, Total	ND		ug/kg	0.50	--
1,1-Dichloropropene	ND		ug/kg	0.50	--
Bromoform	ND		ug/kg	4.0	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.50	--
Benzene	ND		ug/kg	0.50	--
Toluene	ND		ug/kg	1.0	--
Ethylbenzene	ND		ug/kg	1.0	--
Chloromethane	ND		ug/kg	4.0	--
Bromomethane	ND		ug/kg	2.0	--
Vinyl chloride	ND		ug/kg	1.0	--
Chloroethane	ND		ug/kg	2.0	--
1,1-Dichloroethene	ND		ug/kg	1.0	--
trans-1,2-Dichloroethene	ND		ug/kg	1.5	--
Trichloroethene	ND		ug/kg	0.50	--

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2417324
Report Date: 04/03/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 04/01/24 09:43
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1903802-5					
1,2-Dichlorobenzene	ND		ug/kg	2.0	--
1,3-Dichlorobenzene	ND		ug/kg	2.0	--
1,4-Dichlorobenzene	ND		ug/kg	2.0	--
Methyl tert butyl ether	ND		ug/kg	2.0	--
p/m-Xylene	ND		ug/kg	2.0	--
o-Xylene	ND		ug/kg	1.0	--
Xylenes, Total	ND		ug/kg	1.0	--
cis-1,2-Dichloroethene	ND		ug/kg	1.0	--
1,2-Dichloroethene, Total	ND		ug/kg	1.0	--
Dibromomethane	ND		ug/kg	2.0	--
1,2,3-Trichloropropane	ND		ug/kg	2.0	--
Styrene	ND		ug/kg	1.0	--
Dichlorodifluoromethane	ND		ug/kg	10	--
Acetone	ND		ug/kg	25	--
Carbon disulfide	ND		ug/kg	10	--
Methyl ethyl ketone	ND		ug/kg	10	--
Methyl isobutyl ketone	ND		ug/kg	10	--
2-Hexanone	ND		ug/kg	10	--
Bromochloromethane	ND		ug/kg	2.0	--
Tetrahydrofuran	ND		ug/kg	4.0	--
2,2-Dichloropropane	ND		ug/kg	2.0	--
1,2-Dibromoethane	ND		ug/kg	1.0	--
1,3-Dichloropropane	ND		ug/kg	2.0	--
1,1,1,2-Tetrachloroethane	ND		ug/kg	0.50	--
Bromobenzene	ND		ug/kg	2.0	--
n-Butylbenzene	ND		ug/kg	1.0	--
sec-Butylbenzene	ND		ug/kg	1.0	--
tert-Butylbenzene	ND		ug/kg	2.0	--
o-Chlorotoluene	ND		ug/kg	2.0	--

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2417324
Report Date: 04/03/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 04/01/24 09:43
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 Low - Westborough Lab for sample(s): 01 Batch: WG1903802-5					
p-Chlorotoluene	ND		ug/kg	2.0	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	3.0	--
Hexachlorobutadiene	ND		ug/kg	4.0	--
Isopropylbenzene	ND		ug/kg	1.0	--
p-Isopropyltoluene	ND		ug/kg	1.0	--
Naphthalene	ND		ug/kg	4.0	--
n-Propylbenzene	ND		ug/kg	1.0	--
1,2,3-Trichlorobenzene	ND		ug/kg	2.0	--
1,2,4-Trichlorobenzene	ND		ug/kg	2.0	--
1,3,5-Trimethylbenzene	ND		ug/kg	2.0	--
1,2,4-Trimethylbenzene	ND		ug/kg	2.0	--
Diethyl ether	ND		ug/kg	2.0	--
Diisopropyl Ether	ND		ug/kg	2.0	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	2.0	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	2.0	--
1,4-Dioxane	ND		ug/kg	80	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	107		70-130
Toluene-d8	96		70-130
4-Bromofluorobenzene	100		70-130
Dibromofluoromethane	98		70-130

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2417324
Report Date: 04/03/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 04/01/24 09:43
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 High - Westborough Lab for sample(s): 01 Batch: WG1903803-5					
Methylene chloride	ND		ug/kg	250	--
1,1-Dichloroethane	ND		ug/kg	50	--
Chloroform	ND		ug/kg	75	--
Carbon tetrachloride	ND		ug/kg	50	--
1,2-Dichloropropane	ND		ug/kg	50	--
Dibromochloromethane	ND		ug/kg	50	--
1,1,2-Trichloroethane	ND		ug/kg	50	--
Tetrachloroethene	ND		ug/kg	25	--
Chlorobenzene	ND		ug/kg	25	--
Trichlorofluoromethane	ND		ug/kg	200	--
1,2-Dichloroethane	ND		ug/kg	50	--
1,1,1-Trichloroethane	ND		ug/kg	25	--
Bromodichloromethane	ND		ug/kg	25	--
trans-1,3-Dichloropropene	ND		ug/kg	50	--
cis-1,3-Dichloropropene	ND		ug/kg	25	--
1,3-Dichloropropene, Total	ND		ug/kg	25	--
1,1-Dichloropropene	ND		ug/kg	25	--
Bromoform	ND		ug/kg	200	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	25	--
Benzene	ND		ug/kg	25	--
Toluene	ND		ug/kg	50	--
Ethylbenzene	ND		ug/kg	50	--
Chloromethane	ND		ug/kg	200	--
Bromomethane	ND		ug/kg	100	--
Vinyl chloride	ND		ug/kg	50	--
Chloroethane	ND		ug/kg	100	--
1,1-Dichloroethene	ND		ug/kg	50	--
trans-1,2-Dichloroethene	ND		ug/kg	75	--
Trichloroethene	ND		ug/kg	25	--

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2417324
Report Date: 04/03/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 04/01/24 09:43
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 High - Westborough Lab for sample(s): 01 Batch: WG1903803-5					
1,2-Dichlorobenzene	ND		ug/kg	100	--
1,3-Dichlorobenzene	ND		ug/kg	100	--
1,4-Dichlorobenzene	ND		ug/kg	100	--
Methyl tert butyl ether	ND		ug/kg	100	--
p/m-Xylene	ND		ug/kg	100	--
o-Xylene	ND		ug/kg	50	--
Xylenes, Total	ND		ug/kg	50	--
cis-1,2-Dichloroethene	ND		ug/kg	50	--
1,2-Dichloroethene, Total	ND		ug/kg	50	--
Dibromomethane	ND		ug/kg	100	--
1,2,3-Trichloropropane	ND		ug/kg	100	--
Styrene	ND		ug/kg	50	--
Dichlorodifluoromethane	ND		ug/kg	500	--
Acetone	ND		ug/kg	500	--
Carbon disulfide	ND		ug/kg	500	--
Methyl ethyl ketone	ND		ug/kg	500	--
Methyl isobutyl ketone	ND		ug/kg	500	--
2-Hexanone	ND		ug/kg	500	--
Bromochloromethane	ND		ug/kg	100	--
Tetrahydrofuran	ND		ug/kg	200	--
2,2-Dichloropropane	ND		ug/kg	100	--
1,2-Dibromoethane	ND		ug/kg	50	--
1,3-Dichloropropane	ND		ug/kg	100	--
1,1,1,2-Tetrachloroethane	ND		ug/kg	25	--
Bromobenzene	ND		ug/kg	100	--
n-Butylbenzene	ND		ug/kg	50	--
sec-Butylbenzene	ND		ug/kg	50	--
tert-Butylbenzene	ND		ug/kg	100	--
o-Chlorotoluene	ND		ug/kg	100	--

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2417324
Report Date: 04/03/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 04/01/24 09:43
Analyst: AJK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 High - Westborough Lab for sample(s): 01 Batch: WG1903803-5					
p-Chlorotoluene	ND		ug/kg	100	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	150	--
Hexachlorobutadiene	ND		ug/kg	200	--
Isopropylbenzene	ND		ug/kg	50	--
p-Isopropyltoluene	ND		ug/kg	50	--
Naphthalene	ND		ug/kg	200	--
n-Propylbenzene	ND		ug/kg	50	--
1,2,3-Trichlorobenzene	ND		ug/kg	100	--
1,2,4-Trichlorobenzene	ND		ug/kg	100	--
1,3,5-Trimethylbenzene	ND		ug/kg	100	--
1,2,4-Trimethylbenzene	ND		ug/kg	100	--
Diethyl ether	ND		ug/kg	100	--
Diisopropyl Ether	ND		ug/kg	100	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	100	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	100	--
1,4-Dioxane	ND		ug/kg	4000	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	107		70-130
Toluene-d8	96		70-130
4-Bromofluorobenzene	100		70-130
Dibromofluoromethane	98		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2417324
Report Date: 04/03/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1903802-3 WG1903802-4								
Methylene chloride	98		91		70-130	7		20
1,1-Dichloroethane	109		99		70-130	10		20
Chloroform	106		99		70-130	7		20
Carbon tetrachloride	108		99		70-130	9		20
1,2-Dichloropropane	105		100		70-130	5		20
Dibromochloromethane	101		97		70-130	4		20
1,1,2-Trichloroethane	104		100		70-130	4		20
Tetrachloroethene	102		92		70-130	10		20
Chlorobenzene	104		96		70-130	8		20
Trichlorofluoromethane	115		102		70-130	12		20
1,2-Dichloroethane	105		102		70-130	3		20
1,1,1-Trichloroethane	111		101		70-130	9		20
Bromodichloromethane	104		99		70-130	5		20
trans-1,3-Dichloropropene	107		102		70-130	5		20
cis-1,3-Dichloropropene	107		102		70-130	5		20
1,1-Dichloropropene	107		97		70-130	10		20
Bromoform	94		94		70-130	0		20
1,1,2,2-Tetrachloroethane	101		103		70-130	2		20
Benzene	105		97		70-130	8		20
Toluene	105		95		70-130	10		20
Ethylbenzene	107		97		70-130	10		20
Chloromethane	105		94		70-130	11		20
Bromomethane	116		105		70-130	10		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2417324
Report Date: 04/03/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1903802-3 WG1903802-4								
Vinyl chloride	113		100		70-130	12		20
Chloroethane	103		94		70-130	9		20
1,1-Dichloroethene	114		102		70-130	11		20
trans-1,2-Dichloroethene	107		98		70-130	9		20
Trichloroethene	106		96		70-130	10		20
1,2-Dichlorobenzene	103		98		70-130	5		20
1,3-Dichlorobenzene	107		100		70-130	7		20
1,4-Dichlorobenzene	107		99		70-130	8		20
Methyl tert butyl ether	100		98		70-130	2		20
p/m-Xylene	109		99		70-130	10		20
o-Xylene	106		98		70-130	8		20
cis-1,2-Dichloroethene	104		96		70-130	8		20
Dibromomethane	101		98		70-130	3		20
1,2,3-Trichloropropane	98		97		70-130	1		20
Styrene	107		99		70-130	8		20
Dichlorodifluoromethane	104		92		70-130	12		20
Acetone	112		112		70-130	0		20
Carbon disulfide	106		95		70-130	11		20
Methyl ethyl ketone	102		104		70-130	2		20
Methyl isobutyl ketone	97		98		70-130	1		20
2-Hexanone	86		91		70-130	6		20
Bromochloromethane	100		95		70-130	5		20
Tetrahydrofuran	105		104		70-130	1		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2417324
Report Date: 04/03/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1903802-3 WG1903802-4								
2,2-Dichloropropane	112		101		70-130	10		20
1,2-Dibromoethane	105		102		70-130	3		20
1,3-Dichloropropane	104		100		70-130	4		20
1,1,1,2-Tetrachloroethane	104		95		70-130	9		20
Bromobenzene	100		96		70-130	4		20
n-Butylbenzene	116		106		70-130	9		20
sec-Butylbenzene	110		100		70-130	10		20
tert-Butylbenzene	106		97		70-130	9		20
o-Chlorotoluene	108		99		70-130	9		20
p-Chlorotoluene	107		100		70-130	7		20
1,2-Dibromo-3-chloropropane	90		95		70-130	5		20
Hexachlorobutadiene	102		93		70-130	9		20
Isopropylbenzene	109		99		70-130	10		20
p-Isopropyltoluene	106		97		70-130	9		20
Naphthalene	101		100		70-130	1		20
n-Propylbenzene	112		102		70-130	9		20
1,2,3-Trichlorobenzene	104		99		70-130	5		20
1,2,4-Trichlorobenzene	110		104		70-130	6		20
1,3,5-Trimethylbenzene	106		98		70-130	8		20
1,2,4-Trimethylbenzene	106		99		70-130	7		20
Diethyl ether	103		102		70-130	1		20
Diisopropyl Ether	108		103		70-130	5		20
Ethyl-Tert-Butyl-Ether	104		100		70-130	4		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: ANDOVER LF

Project Number: Not Specified

Lab Number: L2417324

Report Date: 04/03/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 Low - Westborough Lab Associated sample(s): 01 Batch: WG1903802-3 WG1903802-4								
Tertiary-Amyl Methyl Ether	97		96		70-130	1		20
1,4-Dioxane	95		94		70-130	1		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	104		107		70-130
Toluene-d8	101		99		70-130
4-Bromofluorobenzene	100		100		70-130
Dibromofluoromethane	99		101		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2417324
Report Date: 04/03/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 High - Westborough Lab Associated sample(s): 01 Batch: WG1903803-3 WG1903803-4								
Methylene chloride	98		91		70-130	7		20
1,1-Dichloroethane	109		99		70-130	10		20
Chloroform	106		99		70-130	7		20
Carbon tetrachloride	108		99		70-130	9		20
1,2-Dichloropropane	105		100		70-130	5		20
Dibromochloromethane	101		97		70-130	4		20
1,1,2-Trichloroethane	104		100		70-130	4		20
Tetrachloroethene	102		92		70-130	10		20
Chlorobenzene	104		96		70-130	8		20
Trichlorofluoromethane	115		102		70-130	12		20
1,2-Dichloroethane	105		102		70-130	3		20
1,1,1-Trichloroethane	111		101		70-130	9		20
Bromodichloromethane	104		99		70-130	5		20
trans-1,3-Dichloropropene	107		102		70-130	5		20
cis-1,3-Dichloropropene	107		102		70-130	5		20
1,1-Dichloropropene	107		97		70-130	10		20
Bromoform	94		94		70-130	0		20
1,1,2,2-Tetrachloroethane	101		103		70-130	2		20
Benzene	105		97		70-130	8		20
Toluene	105		95		70-130	10		20
Ethylbenzene	107		97		70-130	10		20
Chloromethane	105		94		70-130	11		20
Bromomethane	116		105		70-130	10		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2417324
Report Date: 04/03/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 High - Westborough Lab Associated sample(s): 01 Batch: WG1903803-3 WG1903803-4								
Vinyl chloride	113		100		70-130	12		20
Chloroethane	103		94		70-130	9		20
1,1-Dichloroethene	114		102		70-130	11		20
trans-1,2-Dichloroethene	107		98		70-130	9		20
Trichloroethene	106		96		70-130	10		20
1,2-Dichlorobenzene	103		98		70-130	5		20
1,3-Dichlorobenzene	107		100		70-130	7		20
1,4-Dichlorobenzene	107		99		70-130	8		20
Methyl tert butyl ether	100		98		70-130	2		20
p/m-Xylene	109		99		70-130	10		20
o-Xylene	106		98		70-130	8		20
cis-1,2-Dichloroethene	104		96		70-130	8		20
Dibromomethane	101		98		70-130	3		20
1,2,3-Trichloropropane	98		97		70-130	1		20
Styrene	107		99		70-130	8		20
Dichlorodifluoromethane	104		92		70-130	12		20
Acetone	112		112		70-130	0		20
Carbon disulfide	106		95		70-130	11		20
Methyl ethyl ketone	102		104		70-130	2		20
Methyl isobutyl ketone	97		98		70-130	1		20
2-Hexanone	86		91		70-130	6		20
Bromochloromethane	100		95		70-130	5		20
Tetrahydrofuran	105		104		70-130	1		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2417324
Report Date: 04/03/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 High - Westborough Lab Associated sample(s): 01 Batch: WG1903803-3 WG1903803-4								
2,2-Dichloropropane	112		101		70-130	10		20
1,2-Dibromoethane	105		102		70-130	3		20
1,3-Dichloropropane	104		100		70-130	4		20
1,1,1,2-Tetrachloroethane	104		95		70-130	9		20
Bromobenzene	100		96		70-130	4		20
n-Butylbenzene	116		106		70-130	9		20
sec-Butylbenzene	110		100		70-130	10		20
tert-Butylbenzene	106		97		70-130	9		20
o-Chlorotoluene	108		99		70-130	9		20
p-Chlorotoluene	107		100		70-130	7		20
1,2-Dibromo-3-chloropropane	90		95		70-130	5		20
Hexachlorobutadiene	102		93		70-130	9		20
Isopropylbenzene	109		99		70-130	10		20
p-Isopropyltoluene	106		97		70-130	9		20
Naphthalene	101		100		70-130	1		20
n-Propylbenzene	112		102		70-130	9		20
1,2,3-Trichlorobenzene	104		99		70-130	5		20
1,2,4-Trichlorobenzene	110		104		70-130	6		20
1,3,5-Trimethylbenzene	106		98		70-130	8		20
1,2,4-Trimethylbenzene	106		99		70-130	7		20
Diethyl ether	103		102		70-130	1		20
Diisopropyl Ether	108		103		70-130	5		20
Ethyl-Tert-Butyl-Ether	104		100		70-130	4		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: ANDOVER LF

Project Number: Not Specified

Lab Number: L2417324

Report Date: 04/03/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 High - Westborough Lab Associated sample(s): 01 Batch: WG1903803-3 WG1903803-4								
Tertiary-Amyl Methyl Ether	97		96		70-130	1		20
1,4-Dioxane	95		94		70-130	1		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	104		106		70-130
Toluene-d8	101		99		70-130
4-Bromofluorobenzene	100		100		70-130
Dibromofluoromethane	99		101		70-130

SEMIVOLATILES

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2417324
Report Date: 04/03/24

SAMPLE RESULTS

Lab ID: L2417324-01
Client ID: TEWKS LOAM
Sample Location: ANDOVER, MA
Sample Depth:
Matrix: Solid
Analytical Method: 141,8270E
Analytical Date: 04/02/24 09:43
Analyst: SZ
Percent Solids: 78%

Date Collected: 03/29/24 10:00
Date Received: 03/29/24
Field Prep: Not Specified
Extraction Method: EPA 3540C
Extraction Date: 03/30/24 13:05

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	170	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	210	--	1
Hexachlorobenzene	ND		ug/kg	87	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	87	--	1
2-Chloronaphthalene	ND		ug/kg	210	--	1
1,2-Dichlorobenzene	ND		ug/kg	210	--	1
1,3-Dichlorobenzene	ND		ug/kg	210	--	1
1,4-Dichlorobenzene	ND		ug/kg	87	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	210	--	1
2,4-Dinitrotoluene	ND		ug/kg	87	--	1
2,6-Dinitrotoluene	ND		ug/kg	210	--	1
Azobenzene	ND		ug/kg	210	--	1
Fluoranthene	700		ug/kg	120	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	210	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	87	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	220	--	1
Hexachlorobutadiene	ND		ug/kg	210	--	1
Hexachloroethane	ND		ug/kg	87	--	1
Isophorone	ND		ug/kg	190	--	1
Naphthalene	ND		ug/kg	210	--	1
Nitrobenzene	ND		ug/kg	190	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	210	--	1
Butyl benzyl phthalate	ND		ug/kg	210	--	1
Di-n-butylphthalate	ND		ug/kg	210	--	1
Di-n-octylphthalate	ND		ug/kg	210	--	1
Diethyl phthalate	ND		ug/kg	210	--	1
Dimethyl phthalate	ND		ug/kg	87	--	1
Benzo(a)anthracene	380		ug/kg	120	--	1

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2417324
Report Date: 04/03/24

SAMPLE RESULTS

Lab ID: L2417324-01
Client ID: TEWKS LOAM
Sample Location: ANDOVER, MA
Date Collected: 03/29/24 10:00
Date Received: 03/29/24
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(a)pyrene	380		ug/kg	170	--	1
Benzo(b)fluoranthene	540		ug/kg	120	--	1
Benzo(k)fluoranthene	140		ug/kg	120	--	1
Chrysene	410		ug/kg	120	--	1
Acenaphthylene	ND		ug/kg	170	--	1
Anthracene	ND		ug/kg	120	--	1
Benzo(ghi)perylene	270		ug/kg	170	--	1
Fluorene	ND		ug/kg	210	--	1
Phenanthrene	400		ug/kg	120	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	87	--	1
Indeno(1,2,3-cd)pyrene	250		ug/kg	170	--	1
Pyrene	620		ug/kg	120	--	1
Aniline	ND		ug/kg	250	--	1
4-Chloroaniline	ND		ug/kg	210	--	1
Dibenzofuran	ND		ug/kg	210	--	1
2-Methylnaphthalene	ND		ug/kg	87	--	1
Acetophenone	ND		ug/kg	210	--	1
2,4,6-Trichlorophenol	ND		ug/kg	87	--	1
2-Chlorophenol	ND		ug/kg	87	--	1
2,4-Dichlorophenol	ND		ug/kg	87	--	1
2,4-Dimethylphenol	ND		ug/kg	87	--	1
2-Nitrophenol	ND		ug/kg	450	--	1
4-Nitrophenol	ND		ug/kg	290	--	1
2,4-Dinitrophenol	ND		ug/kg	1000	--	1
Pentachlorophenol	ND		ug/kg	420	--	1
Phenol	ND		ug/kg	210	--	1
2-Methylphenol	ND		ug/kg	210	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	300	--	1
2,4,5-Trichlorophenol	ND		ug/kg	210	--	1
Pyridine	ND		ug/kg	220	--	1
Biphenyl	ND		ug/kg	42	--	1

Project Name: ANDOVER LF
Lab Number: L2417324
Project Number: Not Specified
Report Date: 04/03/24

SAMPLE RESULTS

Lab ID: L2417324-01
Client ID: TEWKS LOAM
Sample Location: ANDOVER, MA
Date Collected: 03/29/24 10:00
Date Received: 03/29/24
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	33		30-130
Phenol-d6	35		30-130
Nitrobenzene-d5	35		30-130
2-Fluorobiphenyl	34		30-130
2,4,6-Tribromophenol	**29**	Q	30-130
4-Terphenyl-d14	32		30-130

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2417324
Report Date: 04/03/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E
Analytical Date: 04/02/24 00:18
Analyst: SZ

Extraction Method: EPA 3540C
Extraction Date: 03/30/24 13:05

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01 Batch: WG1902890-1					
Acenaphthene	ND		ug/kg	130	--
1,2,4-Trichlorobenzene	ND		ug/kg	160	--
Hexachlorobenzene	ND		ug/kg	69	--
Bis(2-chloroethyl)ether	ND		ug/kg	69	--
2-Chloronaphthalene	ND		ug/kg	160	--
1,2-Dichlorobenzene	ND		ug/kg	160	--
1,3-Dichlorobenzene	ND		ug/kg	160	--
1,4-Dichlorobenzene	ND		ug/kg	69	--
3,3'-Dichlorobenzidine	ND		ug/kg	160	--
2,4-Dinitrotoluene	ND		ug/kg	69	--
2,6-Dinitrotoluene	ND		ug/kg	160	--
Azobenzene	ND		ug/kg	160	--
Fluoranthene	ND		ug/kg	99	--
4-Bromophenyl phenyl ether	ND		ug/kg	160	--
Bis(2-chloroisopropyl)ether	ND		ug/kg	69	--
Bis(2-chloroethoxy)methane	ND		ug/kg	180	--
Hexachlorobutadiene	ND		ug/kg	160	--
Hexachloroethane	ND		ug/kg	69	--
Isophorone	ND		ug/kg	150	--
Naphthalene	ND		ug/kg	160	--
Nitrobenzene	ND		ug/kg	150	--
Bis(2-ethylhexyl)phthalate	ND		ug/kg	160	--
Butyl benzyl phthalate	ND		ug/kg	160	--
Di-n-butylphthalate	ND		ug/kg	160	--
Di-n-octylphthalate	ND		ug/kg	160	--
Diethyl phthalate	ND		ug/kg	160	--
Dimethyl phthalate	ND		ug/kg	69	--
Benzo(a)anthracene	ND		ug/kg	99	--
Benzo(a)pyrene	ND		ug/kg	130	--

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2417324
Report Date: 04/03/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E
Analytical Date: 04/02/24 00:18
Analyst: SZ

Extraction Method: EPA 3540C
Extraction Date: 03/30/24 13:05

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01 Batch: WG1902890-1					
Benzo(b)fluoranthene	ND		ug/kg	99	--
Benzo(k)fluoranthene	ND		ug/kg	99	--
Chrysene	ND		ug/kg	99	--
Acenaphthylene	ND		ug/kg	130	--
Anthracene	ND		ug/kg	99	--
Benzo(ghi)perylene	ND		ug/kg	130	--
Fluorene	ND		ug/kg	160	--
Phenanthrene	ND		ug/kg	99	--
Dibenzo(a,h)anthracene	ND		ug/kg	69	--
Indeno(1,2,3-cd)pyrene	ND		ug/kg	130	--
Pyrene	ND		ug/kg	99	--
Aniline	ND		ug/kg	200	--
4-Chloroaniline	ND		ug/kg	160	--
Dibenzofuran	ND		ug/kg	160	--
2-Methylnaphthalene	ND		ug/kg	69	--
Acetophenone	ND		ug/kg	160	--
2,4,6-Trichlorophenol	ND		ug/kg	69	--
2-Chlorophenol	ND		ug/kg	69	--
2,4-Dichlorophenol	ND		ug/kg	69	--
2,4-Dimethylphenol	ND		ug/kg	69	--
2-Nitrophenol	ND		ug/kg	360	--
4-Nitrophenol	ND		ug/kg	230	--
2,4-Dinitrophenol	ND		ug/kg	790	--
Pentachlorophenol	ND		ug/kg	330	--
Phenol	ND		ug/kg	160	--
2-Methylphenol	ND		ug/kg	160	--
3-Methylphenol/4-Methylphenol	ND		ug/kg	240	--
2,4,5-Trichlorophenol	ND		ug/kg	160	--
Pyridine	ND		ug/kg	180	--

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2417324
Report Date: 04/03/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E
Analytical Date: 04/02/24 00:18
Analyst: SZ

Extraction Method: EPA 3540C
Extraction Date: 03/30/24 13:05

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01 Batch: WG1902890-1					
Biphenyl	ND		ug/kg	33	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	58		30-130
Phenol-d6	60		30-130
Nitrobenzene-d5	63		30-130
2-Fluorobiphenyl	57		30-130
2,4,6-Tribromophenol	44		30-130
4-Terphenyl-d14	58		30-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2417324
Report Date: 04/03/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01 Batch: WG1902890-2 WG1902890-3								
Acenaphthene	66		56		40-140	16		30
1,2,4-Trichlorobenzene	58		49		40-140	17		30
Hexachlorobenzene	59		50		40-140	17		30
Bis(2-chloroethyl)ether	61		52		40-140	16		30
2-Chloronaphthalene	63		54		40-140	15		30
1,2-Dichlorobenzene	55		47		40-140	16		30
1,3-Dichlorobenzene	55		47		40-140	16		30
1,4-Dichlorobenzene	55		47		40-140	16		30
3,3'-Dichlorobenzidine	51		45		40-140	13		30
2,4-Dinitrotoluene	76		64		40-140	17		30
2,6-Dinitrotoluene	71		60		40-140	17		30
Azobenzene	70		59		40-140	17		30
Fluoranthene	68		58		40-140	16		30
4-Bromophenyl phenyl ether	63		53		40-140	17		30
Bis(2-chloroisopropyl)ether	87		73		40-140	18		30
Bis(2-chloroethoxy)methane	67		55		40-140	20		30
Hexachlorobutadiene	57		49		40-140	15		30
Hexachloroethane	60		51		40-140	16		30
Isophorone	68		55		40-140	21		30
Naphthalene	64		54		40-140	17		30
Nitrobenzene	70		56		40-140	22		30
Bis(2-ethylhexyl)phthalate	85		73		40-140	15		30
Butyl benzyl phthalate	83		72		40-140	14		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2417324
Report Date: 04/03/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01 Batch: WG1902890-2 WG1902890-3								
Di-n-butylphthalate	70		60		40-140	15		30
Di-n-octylphthalate	85		76		40-140	11		30
Diethyl phthalate	65		56		40-140	15		30
Dimethyl phthalate	65		55		40-140	17		30
Benzo(a)anthracene	69		60		40-140	14		30
Benzo(a)pyrene	72		64		40-140	12		30
Benzo(b)fluoranthene	72		63		40-140	13		30
Benzo(k)fluoranthene	71		63		40-140	12		30
Chrysene	72		62		40-140	15		30
Acenaphthylene	63		54		40-140	15		30
Anthracene	68		58		40-140	16		30
Benzo(ghi)perylene	66		60		40-140	10		30
Fluorene	65		55		40-140	17		30
Phenanthrene	67		58		40-140	14		30
Dibenzo(a,h)anthracene	67		60		40-140	11		30
Indeno(1,2,3-cd)pyrene	67		61		40-140	9		30
Pyrene	70		59		40-140	17		30
Aniline	50		**37**	Q	40-140	30		30
4-Chloroaniline	66		57		40-140	15		30
Dibenzofuran	63		54		40-140	15		30
2-Methylnaphthalene	66		57		40-140	15		30
Acetophenone	67		54		40-140	21		30
2,4,6-Trichlorophenol	66		56		30-130	16		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2417324
Report Date: 04/03/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01 Batch: WG1902890-2 WG1902890-3								
2-Chlorophenol	64		52		30-130	21		30
2,4-Dichlorophenol	65		53		30-130	20		30
2,4-Dimethylphenol	78		66		30-130	17		30
2-Nitrophenol	73		60		30-130	20		30
4-Nitrophenol	90		75		30-130	18		30
2,4-Dinitrophenol	**10**	Q	**11**	Q	30-130	10		30
Pentachlorophenol	47		41		30-130	14		30
Phenol	66		53		30-130	22		30
2-Methylphenol	68		55		30-130	21		30
3-Methylphenol/4-Methylphenol	70		56		30-130	22		30
2,4,5-Trichlorophenol	66		56		30-130	16		30
Pyridine	47		39		30-130	19		30
Biphenyl	64		55		40-140	15		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	61		54		30-130
Phenol-d6	62		55		30-130
Nitrobenzene-d5	66		58		30-130
2-Fluorobiphenyl	58		56		30-130
2,4,6-Tribromophenol	51		50		30-130
4-Terphenyl-d14	57		55		30-130

PCBS

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2417324
Report Date: 04/03/24

SAMPLE RESULTS

Lab ID: L2417324-01
Client ID: TEWKS LOAM
Sample Location: ANDOVER, MA

Date Collected: 03/29/24 10:00
Date Received: 03/29/24
Field Prep: Not Specified

Sample Depth:
Matrix: Solid
Analytical Method: 97,8082A
Analytical Date: 04/02/24 23:57
Analyst: EMR
Percent Solids: 78%

Extraction Method: EPA 3540C
Extraction Date: 04/01/24 21:51
Cleanup Method: EPA 3665A
Cleanup Date: 04/02/24
Cleanup Method: EPA 3660B
Cleanup Date: 04/02/24

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	113	--	1	A
Aroclor 1221	ND		ug/kg	113	--	1	A
Aroclor 1232	ND		ug/kg	113	--	1	A
Aroclor 1242	ND		ug/kg	113	--	1	A
Aroclor 1248	ND		ug/kg	113	--	1	A
Aroclor 1254	ND		ug/kg	113	--	1	A
Aroclor 1260	ND		ug/kg	113	--	1	A
Aroclor 1262	ND		ug/kg	113	--	1	A
Aroclor 1268	ND		ug/kg	113	--	1	A
PCBs, Total	ND		ug/kg	113	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	65		30-150	A
Decachlorobiphenyl	59		30-150	A
2,4,5,6-Tetrachloro-m-xylene	64		30-150	B
Decachlorobiphenyl	57		30-150	B

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2417324
Report Date: 04/03/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082A
Analytical Date: 04/02/24 23:27
Analyst: EMR

Extraction Method: EPA 3540C
Extraction Date: 04/01/24 21:51
Cleanup Method: EPA 3665A
Cleanup Date: 04/02/24
Cleanup Method: EPA 3660B
Cleanup Date: 04/02/24

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01 Batch: WG1903531-1						
Aroclor 1016	ND		ug/kg	86.8	--	A
Aroclor 1221	ND		ug/kg	86.8	--	A
Aroclor 1232	ND		ug/kg	86.8	--	A
Aroclor 1242	ND		ug/kg	86.8	--	A
Aroclor 1248	ND		ug/kg	86.8	--	A
Aroclor 1254	ND		ug/kg	86.8	--	A
Aroclor 1260	ND		ug/kg	86.8	--	A
Aroclor 1262	ND		ug/kg	86.8	--	A
Aroclor 1268	ND		ug/kg	86.8	--	A
PCBs, Total	ND		ug/kg	86.8	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	69		30-150	A
Decachlorobiphenyl	74		30-150	A
2,4,5,6-Tetrachloro-m-xylene	74		30-150	B
Decachlorobiphenyl	69		30-150	B

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2417324
Report Date: 04/03/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01 Batch: WG1903531-2 WG1903531-3									
Aroclor 1016	73		72		40-140	1		30	A
Aroclor 1260	74		73		40-140	1		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	68		67		30-150	A
Decachlorobiphenyl	68		70		30-150	A
2,4,5,6-Tetrachloro-m-xylene	71		68		30-150	B
Decachlorobiphenyl	61		61		30-150	B

PESTICIDES

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2417324
Report Date: 04/03/24

SAMPLE RESULTS

Lab ID: L2417324-01
Client ID: TEWKS LOAM
Sample Location: ANDOVER, MA

Date Collected: 03/29/24 10:00
Date Received: 03/29/24
Field Prep: Not Specified

Sample Depth:
Matrix: Solid
Analytical Method: 97,8081B
Analytical Date: 04/02/24 19:20
Analyst: JAG
Percent Solids: 78%

Extraction Method: EPA 3540C
Extraction Date: 03/30/24 10:35
Cleanup Method: EPA 3620B
Cleanup Date: 04/02/24
Cleanup Method: EPA 3660B
Cleanup Date: 04/02/24

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Organochlorine Pesticides - Westborough Lab							
Delta-BHC	ND		ug/kg	5.77	--	1	A
Lindane	ND		ug/kg	1.92	--	1	A
Alpha-BHC	ND		ug/kg	2.40	--	1	A
Beta-BHC	ND		ug/kg	5.77	--	1	A
Heptachlor	ND		ug/kg	2.89	--	1	A
Aldrin	ND		ug/kg	5.77	--	1	A
Heptachlor epoxide	ND		ug/kg	10.8	--	1	A
Endrin	ND		ug/kg	2.40	--	1	A
Endrin ketone	ND		ug/kg	5.77	--	1	A
Dieldrin	9.31		ug/kg	3.61	--	1	B
4,4'-DDE	7.30		ug/kg	5.77	--	1	B
4,4'-DDD	ND		ug/kg	5.77	--	1	B
4,4'-DDT	ND		ug/kg	10.8	--	1	A
Endosulfan I	ND		ug/kg	5.77	--	1	A
Endosulfan II	ND		ug/kg	5.77	--	1	A
Endosulfan sulfate	ND		ug/kg	2.40	--	1	A
Methoxychlor	ND		ug/kg	10.8	--	1	A
Chlordane	ND		ug/kg	48.1	--	1	A
Hexachlorobenzene	ND		ug/kg	5.77	--	1	A
Toxaphene	ND		ug/kg	108	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	65		30-150	A
Decachlorobiphenyl	48		30-150	A
2,4,5,6-Tetrachloro-m-xylene	80		30-150	B
Decachlorobiphenyl	58		30-150	B

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2417324
Report Date: 04/03/24

SAMPLE RESULTS

Lab ID: L2417324-01
Client ID: TEWKS LOAM
Sample Location: ANDOVER, MA
Date Collected: 03/29/24 10:00
Date Received: 03/29/24
Field Prep: Not Specified

Sample Depth:
Matrix: Solid
Analytical Method: 97,8151A
Analytical Date: 04/02/24 20:12
Analyst: AKM
Percent Solids: 78%
Methylation Date: 04/02/24 13:06

Extraction Method: EPA 8151A
Extraction Date: 03/31/24 20:27

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Chlorinated Herbicides - Westborough Lab							
MCPP	ND		ug/kg	4200	--	1	A
MCPA	ND		ug/kg	4200	--	1	A
Dalapon	ND		ug/kg	42	--	1	A
Dicamba	ND		ug/kg	42	--	1	A
Dichloroprop	ND		ug/kg	42	--	1	A
2,4-D	ND		ug/kg	42	--	1	A
2,4-DB	ND		ug/kg	42	--	1	A
2,4,5-T	ND		ug/kg	42	--	1	A
2,4,5-TP (Silvex)	ND		ug/kg	42	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DCAA	107		30-150	A
DCAA	98		30-150	B

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2417324
Report Date: 04/03/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8081B
Analytical Date: 04/02/24 18:56
Analyst: JAG

Extraction Method: EPA 3540C
Extraction Date: 03/30/24 10:35
Cleanup Method: EPA 3620B
Cleanup Date: 04/02/24
Cleanup Method: EPA 3660B
Cleanup Date: 04/02/24

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Organochlorine Pesticides - Westborough Lab for sample(s): 01 Batch: WG1902864-1						
Delta-BHC	ND		ug/kg	4.21	--	A
Lindane	ND		ug/kg	1.40	--	A
Alpha-BHC	ND		ug/kg	1.75	--	A
Beta-BHC	ND		ug/kg	4.21	--	A
Heptachlor	ND		ug/kg	2.10	--	A
Aldrin	ND		ug/kg	4.21	--	A
Heptachlor epoxide	ND		ug/kg	7.89	--	A
Endrin	ND		ug/kg	1.75	--	A
Endrin ketone	ND		ug/kg	4.21	--	A
Dieldrin	ND		ug/kg	2.63	--	A
4,4'-DDE	ND		ug/kg	4.21	--	A
4,4'-DDD	ND		ug/kg	4.21	--	A
4,4'-DDT	ND		ug/kg	7.89	--	A
Endosulfan I	ND		ug/kg	4.21	--	A
Endosulfan II	ND		ug/kg	4.21	--	A
Endosulfan sulfate	ND		ug/kg	1.75	--	A
Methoxychlor	ND		ug/kg	7.89	--	A
Chlordane	ND		ug/kg	35.1	--	A
Hexachlorobenzene	ND		ug/kg	4.21	--	A
Toxaphene	ND		ug/kg	78.9	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	77		30-150	A
Decachlorobiphenyl	59		30-150	A
2,4,5,6-Tetrachloro-m-xylene	100		30-150	B
Decachlorobiphenyl	71		30-150	B

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2417324
Report Date: 04/03/24

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8151A
Analytical Date: 04/02/24 18:41
Analyst: AKM

Extraction Method: EPA 8151A
Extraction Date: 03/31/24 20:27

Methylation Date: 04/02/24 13:06

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Chlorinated Herbicides - Westborough Lab for sample(s): 01 Batch: WG1903095-1						
MCPP	ND		ug/kg	3300	--	A
MCPA	ND		ug/kg	3300	--	A
Dalapon	ND		ug/kg	33	--	A
Dicamba	ND		ug/kg	33	--	A
Dichloroprop	ND		ug/kg	33	--	A
2,4-D	ND		ug/kg	33	--	A
2,4-DB	ND		ug/kg	33	--	A
2,4,5-T	ND		ug/kg	33	--	A
2,4,5-TP (Silvex)	ND		ug/kg	33	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
DCAA	73		30-150	A
DCAA	79		30-150	B

Lab Control Sample Analysis
Batch Quality Control

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2417324
Report Date: 04/03/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Organochlorine Pesticides - Westborough Lab Associated sample(s): 01 Batch: WG1902864-2 WG1902864-3									
Delta-BHC	98		100		40-140	2		30	A
Lindane	92		94		40-140	2		30	A
Alpha-BHC	94		94		40-140	0		30	A
Beta-BHC	110		111		40-140	1		30	A
Heptachlor	95		96		40-140	1		30	A
Aldrin	95		94		40-140	1		30	A
Heptachlor epoxide	84		85		40-140	1		30	A
Endrin	109		108		40-140	1		30	A
Endrin ketone	117		118		40-140	1		30	A
Dieldrin	112		113		40-140	1		30	A
4,4'-DDE	103		102		40-140	1		30	A
4,4'-DDD	123		123		40-140	0		30	A
4,4'-DDT	100		96		40-140	4		30	A
Endosulfan I	100		99		40-140	1		30	A
Endosulfan II	112		112		40-140	0		30	A
Endosulfan sulfate	110		113		40-140	3		30	A
Methoxychlor	125		125		40-140	0		30	A
Hexachlorobenzene	80		85		40-140	6		30	A

Lab Control Sample Analysis

Batch Quality Control

Project Name: ANDOVER LF

Project Number: Not Specified

Lab Number: L2417324

Report Date: 04/03/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Organochlorine Pesticides - Westborough Lab Associated sample(s): 01 Batch: WG1902864-2 WG1902864-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	81		85		30-150	A
Decachlorobiphenyl	102		99		30-150	A
2,4,5,6-Tetrachloro-m-xylene	86		89		30-150	B
Decachlorobiphenyl	87		85		30-150	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: ANDOVER LF

Project Number: Not Specified

Lab Number: L2417324

Report Date: 04/03/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Chlorinated Herbicides - Westborough Lab Associated sample(s): 01 Batch: WG1903095-2 WG1903095-3									
MCPP	117		126		40-140	7		30	A
MCPA	85		88		40-140	3		30	A
Dalapon	72		77		40-140	7		30	A
Dicamba	100		104		40-140	4		30	A
Dichloroprop	100		96		40-140	4		30	A
2,4-D	90		91		40-140	1		30	A
2,4-DB	80		80		40-140	0		30	A
2,4,5-T	87		89		40-140	2		30	A
2,4,5-TP (Silvex)	93		97		40-140	4		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
DCAA	81		86		30-150	A
DCAA	93		100		30-150	B

METALS

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2417324
Report Date: 04/03/24

SAMPLE RESULTS

Lab ID: L2417324-01
Client ID: TEWKS LOAM
Sample Location: ANDOVER, MA
Date Collected: 03/29/24 10:00
Date Received: 03/29/24
Field Prep: Not Specified

Sample Depth:
Matrix: Solid
Percent Solids: 78%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Antimony, Total	ND		mg/kg	4.88	--	2	04/02/24 00:49	04/02/24 23:50	EPA 3050B	97,6010D	DMC
Arsenic, Total	16.4		mg/kg	0.976	--	2	04/02/24 00:49	04/02/24 23:50	EPA 3050B	97,6010D	DMC
Barium, Total	50.8		mg/kg	0.976	--	2	04/02/24 00:49	04/02/24 23:50	EPA 3050B	97,6010D	DMC
Beryllium, Total	ND		mg/kg	0.488	--	2	04/02/24 00:49	04/02/24 23:50	EPA 3050B	97,6010D	DMC
Cadmium, Total	ND		mg/kg	0.976	--	2	04/02/24 00:49	04/02/24 23:50	EPA 3050B	97,6010D	DMC
Chromium, Total	15.1		mg/kg	0.976	--	2	04/02/24 00:49	04/02/24 23:50	EPA 3050B	97,6010D	DMC
Lead, Total	56.7		mg/kg	4.88	--	2	04/02/24 00:49	04/02/24 23:50	EPA 3050B	97,6010D	DMC
Mercury, Total	0.418		mg/kg	0.099	--	1	04/02/24 01:44	04/02/24 12:19	EPA 7471B	97,7471B	MJR
Nickel, Total	12.0		mg/kg	2.44	--	2	04/02/24 00:49	04/02/24 23:50	EPA 3050B	97,6010D	DMC
Selenium, Total	ND		mg/kg	4.88	--	2	04/02/24 00:49	04/02/24 23:50	EPA 3050B	97,6010D	DMC
Silver, Total	ND		mg/kg	0.976	--	2	04/02/24 00:49	04/02/24 23:50	EPA 3050B	97,6010D	DMC
Thallium, Total	ND		mg/kg	4.88	--	2	04/02/24 00:49	04/02/24 23:50	EPA 3050B	97,6010D	DMC
Vanadium, Total	15.1		mg/kg	0.976	--	2	04/02/24 00:49	04/02/24 23:50	EPA 3050B	97,6010D	DMC
Zinc, Total	102		mg/kg	4.88	--	2	04/02/24 00:49	04/02/24 23:50	EPA 3050B	97,6010D	DMC

Project Name: ANDOVER LF
Project Number: Not Specified
Lab Number: L2417324
Report Date: 04/03/24

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1902510-1										
Antimony, Total	ND		mg/kg	2.00	--	1	04/02/24 00:49	04/02/24 23:26	97,6010D	DMC
Arsenic, Total	ND		mg/kg	0.400	--	1	04/02/24 00:49	04/02/24 23:26	97,6010D	DMC
Barium, Total	ND		mg/kg	0.400	--	1	04/02/24 00:49	04/02/24 23:26	97,6010D	DMC
Beryllium, Total	ND		mg/kg	0.200	--	1	04/02/24 00:49	04/02/24 23:26	97,6010D	DMC
Cadmium, Total	ND		mg/kg	0.400	--	1	04/02/24 00:49	04/02/24 23:26	97,6010D	DMC
Chromium, Total	ND		mg/kg	0.400	--	1	04/02/24 00:49	04/02/24 23:26	97,6010D	DMC
Lead, Total	ND		mg/kg	2.00	--	1	04/02/24 00:49	04/02/24 23:26	97,6010D	DMC
Nickel, Total	ND		mg/kg	1.00	--	1	04/02/24 00:49	04/02/24 23:26	97,6010D	DMC
Selenium, Total	ND		mg/kg	2.00	--	1	04/02/24 00:49	04/02/24 23:26	97,6010D	DMC
Silver, Total	ND		mg/kg	0.400	--	1	04/02/24 00:49	04/02/24 23:26	97,6010D	DMC
Thallium, Total	ND		mg/kg	2.00	--	1	04/02/24 00:49	04/02/24 23:26	97,6010D	DMC
Vanadium, Total	ND		mg/kg	0.400	--	1	04/02/24 00:49	04/02/24 23:26	97,6010D	DMC
Zinc, Total	ND		mg/kg	2.00	--	1	04/02/24 00:49	04/02/24 23:26	97,6010D	DMC

Prep Information

Digestion Method: EPA 3050B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01 Batch: WG1902516-1										
Mercury, Total	ND		mg/kg	0.083	--	1	04/02/24 01:44	04/02/24 11:59	97,7471B	MJR

Prep Information

Digestion Method: EPA 7471B

Lab Control Sample Analysis

Batch Quality Control

Project Name: ANDOVER LF

Project Number: Not Specified

Lab Number: L2417324

Report Date: 04/03/24

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1902510-2 WG1902510-3 SRM Lot Number: D123-540								
Antimony, Total	149		143		2-201	4		30
Arsenic, Total	101		99		82-118	2		30
Barium, Total	101		98		82-118	3		30
Beryllium, Total	102		101		83-117	1		30
Cadmium, Total	101		93		83-118	8		30
Chromium, Total	103		102		81-118	1		30
Lead, Total	97		95		82-119	2		30
Nickel, Total	97		96		82-118	1		30
Selenium, Total	104		102		81-119	2		30
Silver, Total	103		102		79-120	1		30
Thallium, Total	116		104		81-120	11		30
Vanadium, Total	98		97		78-122	1		30
Zinc, Total	98		96		80-120	2		30
MCP Total Metals - Mansfield Lab Associated sample(s): 01 Batch: WG1902516-2 WG1902516-3 SRM Lot Number: D123-540								
Mercury, Total	95		97		67-132	2		30

INORGANICS
&
MISCELLANEOUS

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2417324
Report Date: 04/03/24

SAMPLE RESULTS

Lab ID: L2417324-01
Client ID: TEWKS LOAM
Sample Location: ANDOVER, MA

Date Collected: 03/29/24 10:00
Date Received: 03/29/24
Field Prep: Not Specified

Sample Depth:
Matrix: Solid

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	78.0		%	0.100	NA	1	-	03/30/24 09:40	121,2540G	ROI

Project Name: ANDOVER LF
Project Number: Not Specified

Lab Number: L2417324
Report Date: 04/03/24

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2417324-01A	Vial MeOH preserved	A	NA		3.9	Y	Absent		MCP-8260HLW-21(14),MCP-8260H-21(14)
L2417324-01B	Vial water preserved	A	NA		3.9	Y	Absent	29-MAR-24 16:20	MCP-8260HLW-21(14),MCP-8260H-21(14)
L2417324-01C	Vial water preserved	A	NA		3.9	Y	Absent	29-MAR-24 16:20	MCP-8260HLW-21(14),MCP-8260H-21(14)
L2417324-01D	Plastic 2oz unpreserved for TS	A	NA		3.9	Y	Absent		TS(7)
L2417324-01E	Metals Only-Glass 60mL/2oz unpreserved	A	NA		3.9	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-TL-6010T-10(180),MCP-CD-6010T-10(180),MCP-ZN-6010T-10(180),MCP-AG-6010T-10(180),MCP-SB-6010T-10(180),MCP-SE-6010T-10(180),MCP-BE-6010T-10(180),MCP-V-6010T-10(180),MCP-BA-6010T-10(180),MCP-NI-6010T-10(180),MCP-PB-6010T-10(180)
L2417324-01F	Glass 500ml/16oz unpreserved	A	NA		3.9	Y	Absent		MCP-8081-10(14),MCP-8151-10(14),MCP-8082-10-3540C(365),MCP-8270-21(14)

*Values in parentheses indicate holding time in days

Project Name:	ANDOVER LF	**Lab Number:**	L2417324
Project Number:	Not Specified	**Report Date:**	04/03/24

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report

Project Name:	ANDOVER LF	**Lab Number:**	L2417324
Project Number:	Not Specified	**Report Date:**	04/03/24

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA,this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

F - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report

Project Name:	ANDOVER LF	**Lab Number:**	L2417324
Project Number:	Not Specified	**Report Date:**	04/03/24

Data Qualifiers

ND - Not detected at the reporting limit (RL) for the sample.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

V - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Z - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Report Format: Data Usability Report

Project Name:	ANDOVER LF	**Lab Number:**	L2417324
Project Number:	Not Specified	**Report Date:**	04/03/24

REFERENCES

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010; WSC-CAM-IIIA and IIID, January 2024; and WSC-CAM-IIIB and VA, February 2024.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

141 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA and IIB, November 2021.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 524.2: THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625.1: SVOC (Acid/Base/Neutral Extractables).
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb**,** As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

ALPHA ANALYTICAL
8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220
320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Date Rec'd in Lab: 3/29/24

ALPHA Job #: L2417324

Client Information

Client: J Bates and Son
Address: 57 Lawrence St.
Clinton MA 01510
Phone: 978-368-7001
Email: smcnally@jbatesandson.com

Additional Project Information:
* see bottle order
# 461661 for analysis

Project Information

Project Name: Andover LF
Project Location: Andover MA
Project #:
Project Manager: Jennifer Byrnes
ALPHA Quote #:

Turn-Around Time

☐ Standard ☑ RUSH (only confirmed if pre-approved)
Date Due:

Report Information - Data Deliverables

☐ ADEx ☑ EMAIL

Billing Information

☑ Same as Client info PO #: Andover

Regulatory Requirements & Project Information Requirements

☑ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods
☐ Yes ☐ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☐ No NPDES RGP
☐ Other State /Fed Program _____ Criteria _____

ANALYSIS
VOC: ☐ 8260 ☐ 624 ☐ 524.2
SVOC: ☐ ABN ☐ PAH
METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15
METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13
EPH: ☐ Ranges & Targets ☐ Ranges Only
VPH: ☐ Ranges & Targets ☐ Ranges Only
☐ PCB ☐ PEST
TPH: ☐ Quant Only ☐ Fingerprint

SAMPLE INFO
Filtration
☐ Field
☐ Lab to do
Preservation
☐ Lab to do

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	Sample Comments	TOTAL # BOTTLES
17324 01	Tewks Loam	3/29/24	10:00am		AMH		

Container Type
Preservative

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H = $Na_2S_2O_3$
I= Ascorbic Acid
J = NH_4Cl
K= Zn Acetate
O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
	3/29/24 2:31		3/29/24 19:31

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

Pace

Bottle Order Request

Bottle Order # 461661

MAR-27-24 15:17:38

Acctnum : JBATES
Company : J. Bates & Son, LLC
Contact Name : Seth Mcnally
Client PM :
Projectnum :
Projectname :

Request date : 03/27/24
Status : NEED
Sample delivery date :
Projected TAT :
Order taken by : Mark Driver
Linked Call :

Completed by :
Delivery method : P/U Flanders am
Date Completed :

Matrix : SOIL
Samples :
Client IDs : 1

Analytes : Total Solids - SM 2540
MCP 8081B - Organochlorine Pesticides
MCP 8260B VOCs - High & Low Level
0 Trip Blanks
MCP 8270E - Semivolatile Organics
MCP 8151A - Chlorinated Herbicides
MCP 8082A - Polychlorinated Biphenyls
MCP 6010D/7470A - Targets: MCP 14 Metals

Container	Quantity	Analyte Label
Glass 500ml/16oz unpreserved		MCP-8270-21 MCP-8081-10 MCP-8082-10 MCP-8151-10
Metals Only-Glass 60mL/2oz unpr		MCP14
Plastic 2oz unpreserved for TS		
5 mL Syringe for VOA		
Vial MeOH preserved		MCP-8260HLW-21 (High)
Vial water preserved		MCP-8260HLW-21 (Low)

Bottle Quantity Summary:

5 mL Syringe for VOA
Glass 500ml/16oz unpreserved
Metals Only-Glass 60mL/2oz unpr
Plastic 2oz unpreserved for TS
Vial MeOH preserved
Vial water preserved

Trip Blanks and Miscellaneous Field Blanks:

Special Shipping Requirements			
Cooler [X]	Dangerous Goods	NJ Courier Pickup Label	Return Shipping Labels

Pending Shipping Date(s)
03/28/24

PLEASE PUT SAMPLES ON ICE
EXCEPT CANISTER OR BAG SAMPLES

Serial_No:04032411:40

Method Blank Summary
Form 4
Volatiles

Client	: J. Bates & Son, LLC	**Lab Number**	: L2417324
Project Name	: ANDOVER LF	**Project Number**	:
Lab Sample ID	: WG1903803-5	**Lab File ID**	: V17240401A05
Instrument ID	: VOA117		
Matrix	: SOLID	**Analysis Date**	: 04/01/24 09:43

Client Sample No.	Lab Sample ID	Analysis Date
WG1903803-3LCS	WG1903803-3	04/01/24 07:58
WG1903803-4LCSD	WG1903803-4	04/01/24 08:25
TEWKS LOAM	L2417324-01	04/01/24 15:26

Method Blank Summary
Form 4
Volatiles

Client	: J. Bates & Son, LLC	**Lab Number**	: L2417324
Project Name	: ANDOVER LF	**Project Number**	:
Lab Sample ID	: WG1903802-5	**Lab File ID**	: V17240401A05
Instrument ID	: VOA117		
Matrix	: SOLID	**Analysis Date**	: 04/01/24 09:43

Client Sample No.	Lab Sample ID	Analysis Date
WG1903802-3LCS	WG1903802-3	04/01/24 07:58
WG1903802-4LCSD	WG1903802-4	04/01/24 08:25
TEWKS LOAM	L2417324-01	04/01/24 14:59

Calibration Verification Summary
Form 7
Volatiles

Client	: J. Bates & Son, LLC	**Lab Number**	: L2417324
Project Name	: ANDOVER LF	**Project Number**	:
Instrument ID	: VOA117	**Calibration Date**	: 04/01/24 07:58
Lab File ID	: V17240401A01	**Init. Calib. Date(s)**	: 03/26/24 03/27/24
Sample No	: WG1903802-2	**Init. Calib. Times**	: 20:19 00:41
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
Fluorobenzene	1	1	-	0	20	97	0
Dichlorodifluoromethane	0.205	0.213	-	-3.9	20	97	0
Chloromethane	0.348	0.364	-	-4.6	20	105	0
Vinyl chloride	0.282	0.319	-	-13.1	20	102	0
Bromomethane	0.15	0.175	-	-16.7	20	110	0
Chloroethane	0.19	0.196	-	-3.2	20	104	0
Trichlorofluoromethane	0.333	0.382	-	-14.7	20	107	0
Ethyl ether	0.093	0.097	-	-4.3	20	98	0
1,1-Dichloroethene	0.203	0.23	-	-13.3	20	104	0
Carbon disulfide	0.718	0.758	-	-5.6	20	102	0
Freon-113	0.213	0.242	-	-13.6	20	106	0
Acrolein	0.021	0.025	-	-19	20	111	0
Methylene chloride	0.237	0.232	-	2.1	20	97	0
Acetone	40	44.742	-	-11.9	20	108	0
trans-1,2-Dichloroethene	0.245	0.262	-	-6.9	20	98	0
Methyl acetate	0.117	0.111	-	5.1	20	98	0
Methyl tert-butyl ether	0.509	0.511	-	-0.4	20	93	0
tert-Butyl alcohol	0.017	0.016	-	5.9	20	88	0
Diisopropyl ether	0.847	0.917	-	-8.3	20	99	0
1,1-Dichloroethane	0.474	0.515	-	-8.6	20	100	0
Halothane	0.192	0.205	-	-6.8	20	97	0
Acrylonitrile	40	40.476	-	-1.2	20	98	0
Ethyl tert-butyl ether	0.752	0.782	-	-4	20	95	0
Vinyl acetate	0.409	0.472	-	-15.4	20	104	0
cis-1,2-Dichloroethene	0.265	0.276	-	-4.2	20	97	0
2,2-Dichloropropane	0.351	0.394	-	-12.3	20	104	0
Bromochloromethane	0.118	0.118	-	0	20	92	0
Cyclohexane	0.491	0.549	-	-11.8	20	104	0
Chloroform	0.428	0.454	-	-6.1	20	98	0
Ethyl acetate	0.167	0.161	-	3.6	20	95	0
Carbon tetrachloride	0.346	0.375	-	-8.4	20	99	0
Tetrahydrofuran	40	41.903	-	-4.8	20	99	0
Dibromofluoromethane	0.257	0.254	-	1.2	20	95	0
1,1,1-Trichloroethane	0.373	0.415	-	-11.3	20	100	0
2-Butanone	0.068	0.069	-	-1.5	20	102	0
1,1-Dichloropropene	40	42.676	-	-6.7	20	102	0
Benzene	0.889	0.935	-	-5.2	20	97	0
tert-Amyl methyl ether	0.536	0.521	-	2.8	20	89	0
1,2-Dichloroethane-d4	0.242	0.252	-	-4.1	20	102	0
1,2-Dichloroethane	0.287	0.302	-	-5.2	20	98	0
Methyl cyclohexane	0.428	0.455	-	-6.3	20	99	0
Trichloroethene	0.26	0.275	-	-5.8	20	99	0
Dibromomethane	0.117	0.119	-	-1.7	20	94	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: J. Bates & Son, LLC		**Lab Number**	: L2417324	
Project Name	: ANDOVER LF		**Project Number**	:	
Instrument ID	: VOA117		**Calibration Date**	: 04/01/24 07:58	
Lab File ID	: V17240401A01		**Init. Calib. Date(s)**	: 03/26/24	03/27/24
Sample No	: WG1903802-2		**Init. Calib. Times**	: 20:19	00:41
Channel	:				

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
1,2-Dichloropropane	0.249	0.262	-	-5.2	20	97	0
2-Chloroethyl vinyl ether	0.113	0.1	-	11.5	20	82	0
Bromodichloromethane	0.295	0.308	-	-4.4	20	95	0
1,4-Dioxane	2000	1904.814	-	4.8	20	91	0
cis-1,3-Dichloropropene	0.329	0.351	-	-6.7	20	95	0
Chlorobenzene-d5	1	1	-	0	20	95	0
Toluene-d8	1.286	1.303	-	-1.3	20	96	0
Toluene	0.755	0.791	-	-4.8	20	96	0
4-Methyl-2-pentanone	0.074	0.072	-	2.7	20	88	0
Tetrachloroethene	40	41.018	-	-2.5	20	98	0
trans-1,3-Dichloropropene	0.369	0.395	-	-7	20	94	0
Ethyl methacrylate	0.228	0.225	-	1.3	20	86	0
1,1,2-Trichloroethane	0.177	0.184*	-	-4	20	93	0
Chlorodibromomethane	0.287	0.291	-	-1.4	20	90	0
1,3-Dichloropropane	0.355	0.369	-	-3.9	20	94	0
1,2-Dibromoethane	0.21	0.22	-	-4.8	20	91	0
2-Hexanone	0.145	0.125	-	13.8	20	87	0
Chlorobenzene	0.852	0.889	-	-4.3	20	95	0
Ethylbenzene	1.447	1.547	-	-6.9	20	99	0
1,1,1,2-Tetrachloroethane	0.323	0.336	-	-4	20	93	0
p/m Xylene	0.556	0.606	-	-9	20	98	0
o Xylene	0.545	0.579	-	-6.2	20	96	0
Styrene	0.871	0.934	-	-7.2	20	95	0
1,4-Dichlorobenzene-d4	1	1	-	0	20	95	0
Bromoform	0.307	0.291	-	5.2	20	85	0
Isopropylbenzene	2.687	2.919	-	-8.6	20	98	0
4-Bromofluorobenzene	0.843	0.844	-	-0.1	20	95	0
Bromobenzene	0.661	0.663	-	-0.3	20	92	0
n-Propylbenzene	3.053	3.412	-	-11.8	20	101	0
1,4-Dichlorobutane	0.735	0.755	-	-2.7	20	95	0
1,1,2,2-Tetrachloroethane	0.457	0.462	-	-1.1	20	91	0
4-Ethyltoluene	2.637	2.901	-	-10	20	100	0
2-Chlorotoluene	1.785	1.93	-	-8.1	20	100	0
1,3,5-Trimethylbenzene	2.329	2.482	-	-6.6	20	97	0
1,2,3-Trichloropropane	0.351	0.343	-	2.3	20	92	0
trans-1,4-Dichloro-2-buten	0.142	0.155	-	-9.2	20	100	0
4-Chlorotoluene	1.867	2.007	-	-7.5	20	100	0
tert-Butylbenzene	2.08	2.215	-	-6.5	20	95	0
1,2,4-Trimethylbenzene	2.288	2.423	-	-5.9	20	98	0
sec-Butylbenzene	3.017	3.325	-	-10.2	20	99	0
p-Isopropyltoluene	40	42.443	-	-6.1	20	99	0
1,3-Dichlorobenzene	1.309	1.401	-	-7	20	99	0
1,4-Dichlorobenzene	1.306	1.4	-	-7.2	20	100	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: J. Bates & Son, LLC		**Lab Number**	: L2417324	
Project Name	: ANDOVER LF		**Project Number**	:	
Instrument ID	: VOA117		**Calibration Date**	: 04/01/24 07:58	
Lab File ID	: V17240401A01		**Init. Calib. Date(s)**	: 03/26/24	03/27/24
Sample No	: WG1903802-2		**Init. Calib. Times**	: 20:19	00:41
Channel	:				

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
p-Diethylbenzene	1.681	1.802	-	-7.2	20	101	0
n-Butylbenzene	2.213	2.578	-	-16.5	20	105	0
1,2-Dichlorobenzene	1.21	1.245	-	-2.9	20	95	0
1,2,4,5-Tetramethylbenzene	2.498	2.713	-	-8.6	20	97	0
1,2-Dibromo-3-chloropropan	0.077	0.069	-	10.4	20	80	0
1,3,5-Trichlorobenzene	0.993	1.089	-	-9.7	20	102	0
Hexachlorobutadiene	0.512	0.523	-	-2.1	20	92	0
1,2,4-Trichlorobenzene	0.825	0.911	-	-10.4	20	102	0
Naphthalene	1.631	1.644	-	-0.8	20	90	0
1,2,3-Trichlorobenzene	0.745	0.777	-	-4.3	20	96	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: J. Bates & Son, LLC	**Lab Number**	: L2417324
Project Name	: ANDOVER LF	**Project Number**	:
Instrument ID	: VOA117	**Calibration Date**	: 04/01/24 07:58
Lab File ID	: V17240401A01	**Init. Calib. Date(s)**	: 03/26/24 03/27/24
Sample No	: WG1903803-2	**Init. Calib. Times**	: 20:19 00:41
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
Fluorobenzene	1	1	-	0	20	97	0
Dichlorodifluoromethane	0.205	0.213	-	-3.9	20	97	0
Chloromethane	0.348	0.364	-	-4.6	20	105	0
Vinyl chloride	0.282	0.319	-	-13.1	20	102	0
Bromomethane	0.15	0.175	-	-16.7	20	110	0
Chloroethane	0.19	0.196	-	-3.2	20	104	0
Trichlorofluoromethane	0.333	0.382	-	-14.7	20	107	0
Ethyl ether	0.093	0.097	-	-4.3	20	98	0
1,1-Dichloroethene	0.203	0.23	-	-13.3	20	104	0
Carbon disulfide	0.718	0.758	-	-5.6	20	102	0
Freon-113	0.213	0.242	-	-13.6	20	106	0
Acrolein	0.021	0.025	-	-19	20	111	0
Methylene chloride	0.237	0.232	-	2.1	20	97	0
Acetone	40	44.742	-	-11.9	20	108	0
trans-1,2-Dichloroethene	0.245	0.262	-	-6.9	20	98	0
Methyl acetate	0.117	0.111	-	5.1	20	98	0
Methyl tert-butyl ether	0.509	0.511	-	-0.4	20	93	0
tert-Butyl alcohol	0.017	0.016	-	5.9	20	88	0
Diisopropyl ether	0.847	0.917	-	-8.3	20	99	0
1,1-Dichloroethane	0.474	0.515	-	-8.6	20	100	0
Halothane	0.192	0.205	-	-6.8	20	97	0
Acrylonitrile	40	40.476	-	-1.2	20	98	0
Ethyl tert-butyl ether	0.752	0.782	-	-4	20	95	0
Vinyl acetate	0.409	0.472	-	-15.4	20	104	0
cis-1,2-Dichloroethene	0.265	0.276	-	-4.2	20	97	0
2,2-Dichloropropane	0.351	0.394	-	-12.3	20	104	0
Bromochloromethane	0.118	0.118	-	0	20	92	0
Cyclohexane	0.491	0.549	-	-11.8	20	104	0
Chloroform	0.428	0.454	-	-6.1	20	98	0
Ethyl acetate	0.167	0.161	-	3.6	20	95	0
Carbon tetrachloride	0.346	0.375	-	-8.4	20	99	0
Tetrahydrofuran	40	41.903	-	-4.8	20	99	0
Dibromofluoromethane	0.257	0.254	-	1.2	20	95	0
1,1,1-Trichloroethane	0.373	0.415	-	-11.3	20	100	0
2-Butanone	0.068	0.069	-	-1.5	20	102	0
1,1-Dichloropropene	40	42.676	-	-6.7	20	102	0
Benzene	0.889	0.935	-	-5.2	20	97	0
tert-Amyl methyl ether	0.536	0.521	-	2.8	20	89	0
1,2-Dichloroethane-d4	0.242	0.252	-	-4.1	20	102	0
1,2-Dichloroethane	0.287	0.302	-	-5.2	20	98	0
Methyl cyclohexane	0.428	0.455	-	-6.3	20	99	0
Trichloroethene	0.26	0.275	-	-5.8	20	99	0
Dibromomethane	0.117	0.119	-	-1.7	20	94	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: J. Bates & Son, LLC	**Lab Number**	: L2417324
Project Name	: ANDOVER LF	**Project Number**	:
Instrument ID	: VOA117	**Calibration Date**	: 04/01/24 07:58
Lab File ID	: V17240401A01	**Init. Calib. Date(s)**	: 03/26/24 03/27/24
Sample No	: WG1903803-2	**Init. Calib. Times**	: 20:19 00:41
Channel	:		

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
1,2-Dichloropropane	0.249	0.262	-	-5.2	20	97	0
2-Chloroethyl vinyl ether	0.113	0.1	-	11.5	20	82	0
Bromodichloromethane	0.295	0.308	-	-4.4	20	95	0
1,4-Dioxane	2000	1904.814	-	4.8	20	91	0
cis-1,3-Dichloropropene	0.329	0.351	-	-6.7	20	95	0
Chlorobenzene-d5	1	1	-	0	20	95	0
Toluene-d8	1.286	1.303	-	-1.3	20	96	0
Toluene	0.755	0.791	-	-4.8	20	96	0
4-Methyl-2-pentanone	0.074	0.072	-	2.7	20	88	0
Tetrachloroethene	40	41.018	-	-2.5	20	98	0
trans-1,3-Dichloropropene	0.369	0.395	-	-7	20	94	0
Ethyl methacrylate	0.228	0.225	-	1.3	20	86	0
1,1,2-Trichloroethane	0.177	0.184*	-	-4	20	93	0
Chlorodibromomethane	0.287	0.291	-	-1.4	20	90	0
1,3-Dichloropropane	0.355	0.369	-	-3.9	20	94	0
1,2-Dibromoethane	0.21	0.22	-	-4.8	20	91	0
2-Hexanone	0.145	0.125	-	13.8	20	87	0
Chlorobenzene	0.852	0.889	-	-4.3	20	95	0
Ethylbenzene	1.447	1.547	-	-6.9	20	99	0
1,1,1,2-Tetrachloroethane	0.323	0.336	-	-4	20	93	0
p/m Xylene	0.556	0.606	-	-9	20	98	0
o Xylene	0.545	0.579	-	-6.2	20	96	0
Styrene	0.871	0.934	-	-7.2	20	95	0
1,4-Dichlorobenzene-d4	1	1	-	0	20	95	0
Bromoform	0.307	0.291	-	5.2	20	85	0
Isopropylbenzene	2.687	2.919	-	-8.6	20	98	0
4-Bromofluorobenzene	0.843	0.844	-	-0.1	20	95	0
Bromobenzene	0.661	0.663	-	-0.3	20	92	0
n-Propylbenzene	3.053	3.412	-	-11.8	20	101	0
1,4-Dichlorobutane	0.735	0.755	-	-2.7	20	95	0
1,1,2,2-Tetrachloroethane	0.457	0.462	-	-1.1	20	91	0
4-Ethyltoluene	2.637	2.901	-	-10	20	100	0
2-Chlorotoluene	1.785	1.93	-	-8.1	20	100	0
1,3,5-Trimethylbenzene	2.329	2.482	-	-6.6	20	97	0
1,2,3-Trichloropropane	0.351	0.343	-	2.3	20	92	0
trans-1,4-Dichloro-2-buten	0.142	0.155	-	-9.2	20	100	0
4-Chlorotoluene	1.867	2.007	-	-7.5	20	100	0
tert-Butylbenzene	2.08	2.215	-	-6.5	20	95	0
1,2,4-Trimethylbenzene	2.288	2.423	-	-5.9	20	98	0
sec-Butylbenzene	3.017	3.325	-	-10.2	20	99	0
p-Isopropyltoluene	40	42.443	-	-6.1	20	99	0
1,3-Dichlorobenzene	1.309	1.401	-	-7	20	99	0
1,4-Dichlorobenzene	1.306	1.4	-	-7.2	20	100	0

* Value outside of QC limits.

Calibration Verification Summary
Form 7
Volatiles

Client	: J. Bates & Son, LLC		**Lab Number**	: L2417324	
Project Name	: ANDOVER LF		**Project Number**	:	
Instrument ID	: VOA117		**Calibration Date**	: 04/01/24 07:58	
Lab File ID	: V17240401A01		**Init. Calib. Date(s)**	: 03/26/24	03/27/24
Sample No	: WG1903803-2		**Init. Calib. Times**	: 20:19	00:41
Channel	:				

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
p-Diethylbenzene	1.681	1.802	-	-7.2	20	101	0
n-Butylbenzene	2.213	2.578	-	-16.5	20	105	0
1,2-Dichlorobenzene	1.21	1.245	-	-2.9	20	95	0
1,2,4,5-Tetramethylbenzene	2.498	2.713	-	-8.6	20	97	0
1,2-Dibromo-3-chloropropan	0.077	0.069	-	10.4	20	80	0
1,3,5-Trichlorobenzene	0.993	1.089	-	-9.7	20	102	0
Hexachlorobutadiene	0.512	0.523	-	-2.1	20	92	0
1,2,4-Trichlorobenzene	0.825	0.911	-	-10.4	20	102	0
Naphthalene	1.631	1.644	-	-0.8	20	90	0
1,2,3-Trichlorobenzene	0.745	0.777	-	-4.3	20	96	0

* Value outside of QC limits.

Performance Evaluation Mixture Summary
Form 15
Pesticides

Client	: J. Bates & Son, LLC	**Lab Number**	: L2417324
Project Name	: ANDOVER LF	**Project Number**	:
Instrument ID	: PEST15	**Analysis Date**	: 04/01/24 06:50
PEM Standard	: R1811918-1		
Column 1	: RTX-5	**Column 2**	: RTX-CLPPesticides2

Parameter	Signal 1	Signal 2
4,4'-DDE	0	0
Endrin	176479368.81276	231098721.96173
4,4'-DDD	269939.61692	577229.75302
4,4'-DDT	326357558.3979	410911728.91843
Endrin Aldehyde	0	191408.67559
Endrin Ketone	650117.48174	787967.44824

Parameter	%Breakdown 1	%Breakdown 2
Endrin	0.367	0.422
DDT	0.0826	0.140

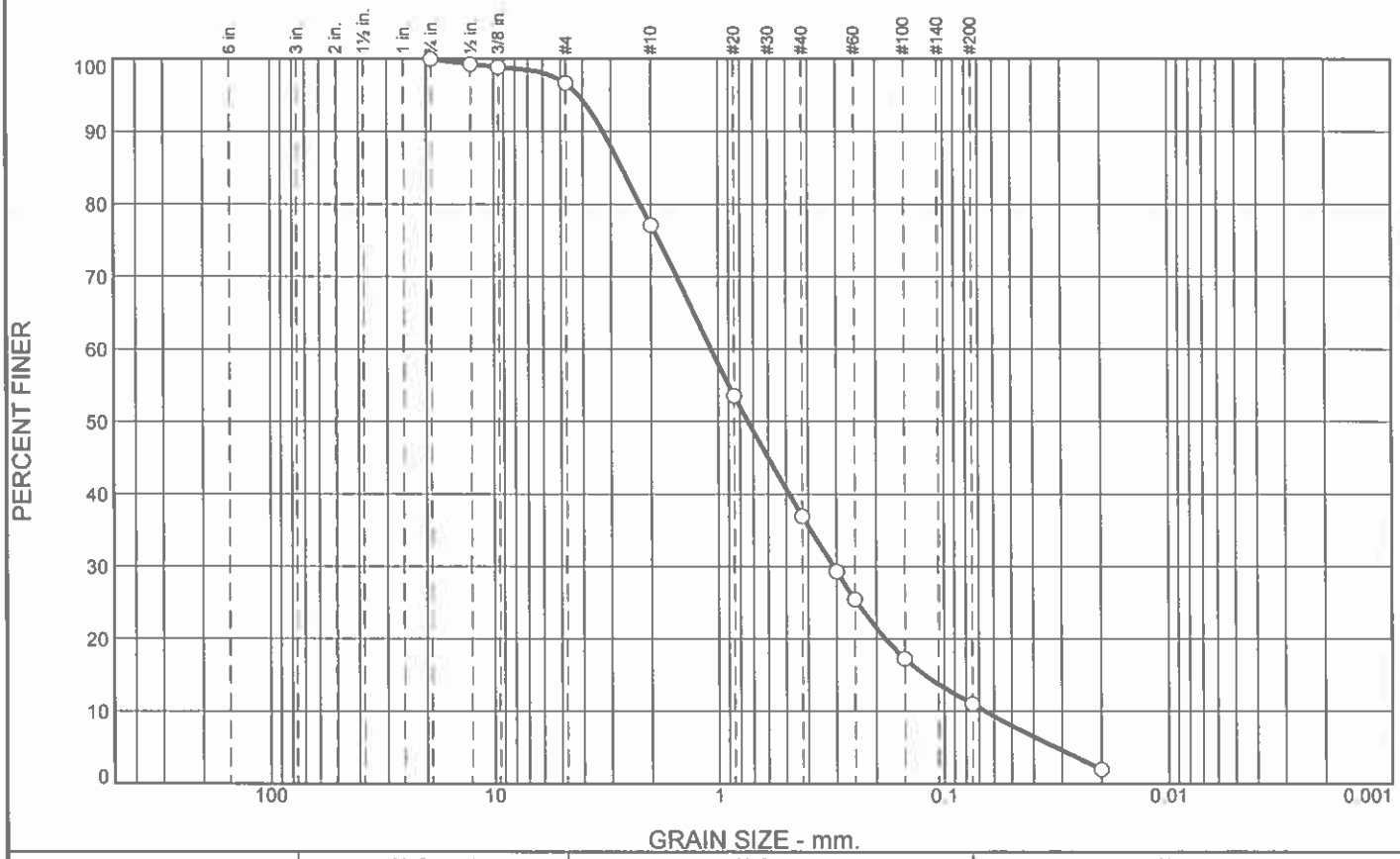
Performance Evaluation Mixture Summary
Form 15
Pesticides

Client	: J. Bates & Son, LLC	**Lab Number**	: L2417324
Project Name	: ANDOVER LF	**Project Number**	:
Instrument ID	: PEST11	**Analysis Date**	: 04/02/24 09:00
PEM Standard	: R1812508-1		
Column 1	: RTX-5	**Column 2**	: RTX-CLPPesticides2

Parameter	Signal 1	Signal 2
4,4'-DDE	0	388659.60608
Endrin	372195893.81845	372530729.53934
4,4'-DDD	682259.43511	927427.24222
4,4'-DDT	666297344.04194	670541447.32583
Endrin Aldehyde	0	0
Endrin Ketone	404283.07462	623150.34014

Parameter	%Breakdown 1	%Breakdown 2
Endrin	0.108	0.167
DDT	0.102	0.196

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.3	19.6	40.2	25.9	11.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	99.3		
3/8"	98.9		
#4	96.7		
#10	77.1		
#20	53.5		
#40	36.9		
#50	29.3		
#60	25.5		
#100	17.3		
#200	11.0		
#635	1.9		

* (no specification provided)

Material Description

Screen Loam
USDA Textural Classification = Sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 2.6893 D_{60}= 1.0794 D_{50}= 0.7393
D_{30}= 0.3099 D_{15}= 0.1221 D_{10}= 0.0658
C_u= 16.40 C_c= 1.35

Classification

USCS= SW-SM AASHTO= A-1-b

Remarks

Sample was submitted by client on 06/28/24
See loam letter for additional information

Sample No.: L-34799 **Source of Sample:** Andover SLF 2024 **Date:** 7/3/24
Location: Screen Loam **Elev./Depth:** 1000 CY

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

July 3, 2024

Mr. John Bates
J. Bates & Son LLC
57 Lawrence Street
Clinton, MA 01510

RE: Topsoil Laboratory Test Results
Andover LF - Loam
Andover, Massachusetts **Project # 26023**

Dear Mr. Bates;

We submit herein the results of pH, organic content, macro-nutrient, and gradation analyses completed on topsoil sample **L-34799**, submitted on June 28, 2024 and stated to represent above source. The gradation and organic tests were completed per ASTM D-422 & D-2974, while the nutrient tests were in accordance with the standard LaMotte procedures. The lab results and conclusions are summarized below:

pH = 5.8, Close to neutral
Organic Content = 8.4 %, good
Nitrogen, N = 30 lb./acre
Phosphorus, P = 200 lb./acre good, minimal additional phosphorus suggested

USDA Sizing	Gravel (>#10)	Sand (#10 to .05)	Silt (<.05 to >002)	Clay (<.002)
Total Gradation:	23	66	9	2
Sand Fraction:	0	86	12	2

USDA Textural (based on 100% < #10 sieve) Topsoil Classification = Sand
Observations:

Based on the 6.4 pH reading, we suggest 500 lb./acre (12 lb./1000 ft^2) of lime to "sweeten" the soil and improve nutrient absorption. In addition, we believe that 1000 lb./acre (25 lb./1000 ft^2) of a balanced fertilizer (about 10-10-10) should be applied to achieve and maintain moderate lawn grass growth.

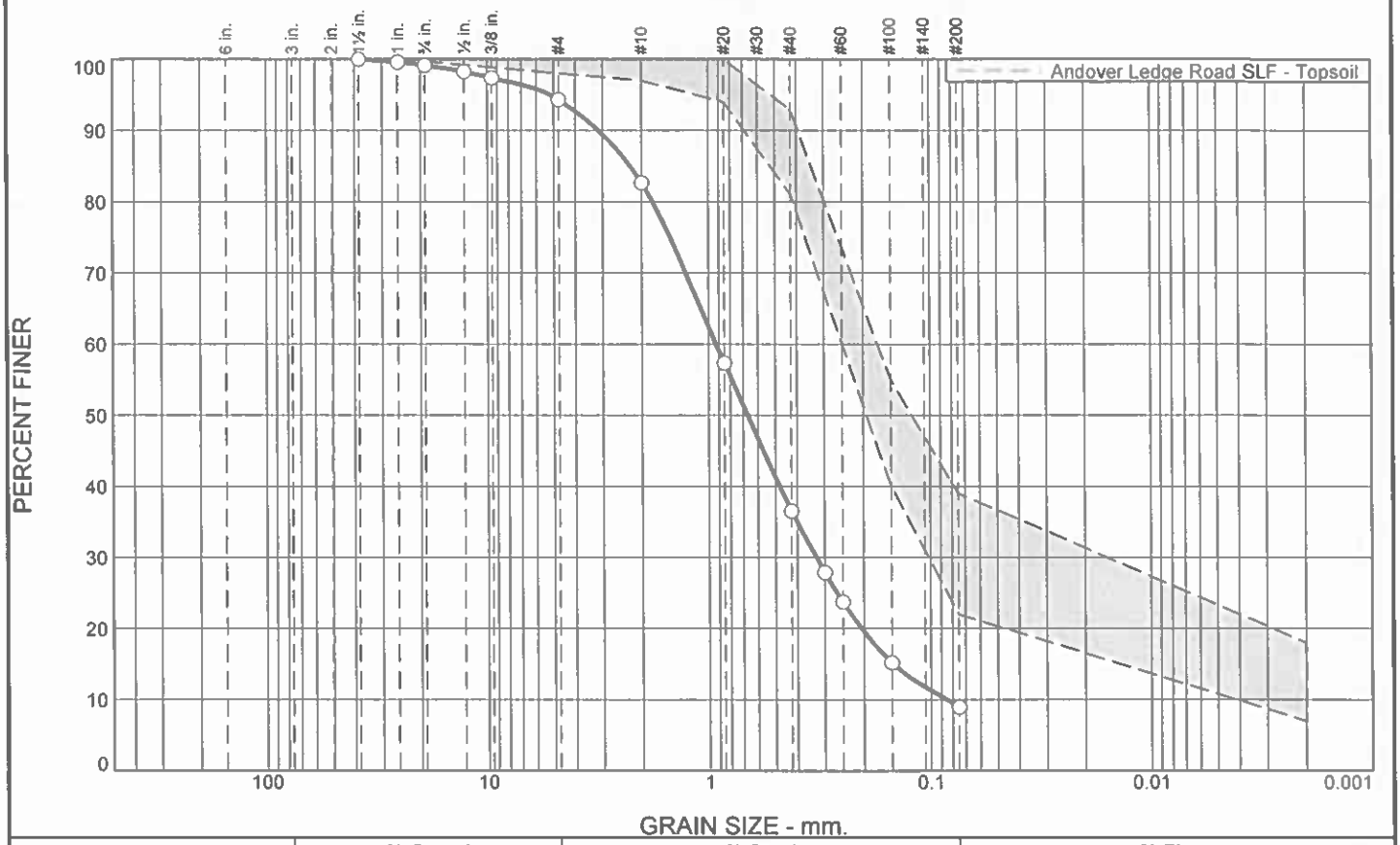
We believe that you will find this information, and the attached gradation curve, helpful in evaluating the material. Should you have any questions, or require further testing assistance, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E.,P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.9	4.8	11.7	46.1	27.5	9.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	100.0	100	
.75	99.1		
.5	98.3		
3/8	97.4		
#4	94.3		
#10	82.6	97-100	X
#20	57.3	94-100	X
#40	36.5	81-93	X
#50	27.9		
#60	23.7		
#100	15.2	40-55	X
#200	9.0	22-39	X

* Andover Ledge Road SLF - Topsoil

Material Description

Dark brown sand trace silt trace gravel
USDA Textural Classification = Sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 2.2510 D_{60}= 0.9289 D_{50}= 0.6691
D_{30}= 0.3279 D_{15}= 0.1475 D_{10}= 0.0849
C_u= 10.94 C_c= 1.36

Classification

USCS= SW-SM AASHTO= A-1-b

Remarks

Sample was submitted by client on 06/28/24
Close to project "Topsoil" gradation limits

Sample No.: L-34800 **Source of Sample:** Andover SLF **Date:** 7/5/24
Location: Screen Loam **Elev./Depth:** 2000 CY

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

July 5, 2024

Mr. John Bates
J. Bates & Son LLC
57 Lawrence Street
Clinton, MA 01510

RE: Topsoil Laboratory Test Results
Onsite Loam – 2000 CY
Andover, Massachusetts **Project # 26023**

Dear Mr. Bates;

We submit herein the results of pH, organic content, macro-nutrient, and gradation/hydrometer analyses completed on topsoil sample **L-33800**, submitted on June 28, 2024 and stated to represent above source. The gradation and organic tests were completed per ASTM D-422 & D-2974, while the nutrient tests were in accordance with the standard LaMotte procedures. The lab results and conclusions are summarized below:

pH = 5.9, met the project limits of 5.5 to 7.0
Organic Content = 8%, met the 8% to 10% project limits
Nitrogen, N =50 lb./acre fair, little additional nitrogen suggested
Phosphorus, P = 200 lb./acre good, minimum additional phosphorus suggested

USDA Sizing	Gravel (>#10)	Sand (#10 to .05)	Silt (<.05 to >002)	Clay (<.002)
Total Gradation:	6	85	7	2
Sand Fraction:	0	90	8	2

USDA Textural (based on 100% < #10 sieve) Topsoil Classification = Sand, project classification requirement??
Observations:

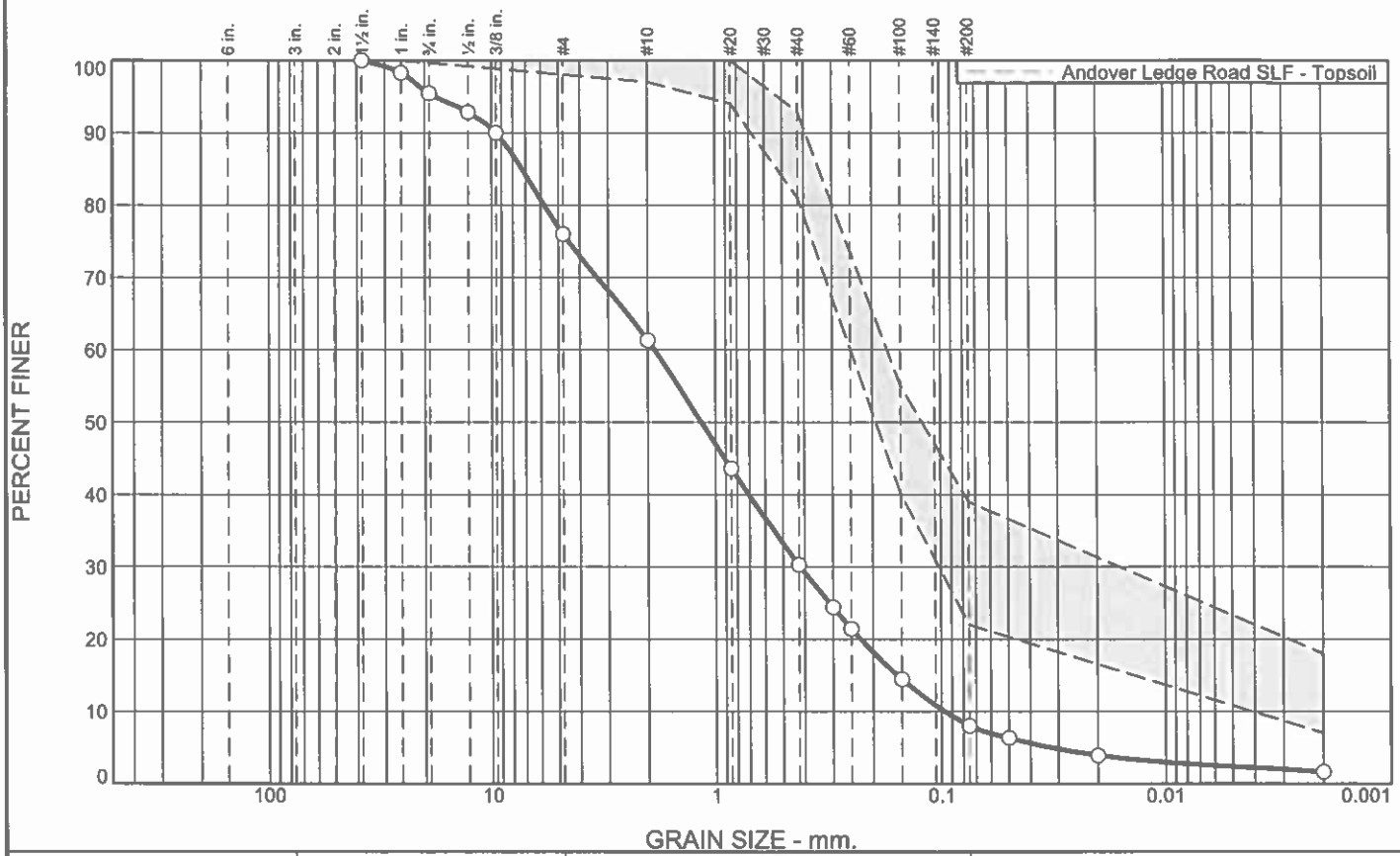
We believe that you will find this information, and the attached gradation curve, helpful in evaluating the material. Should you have any questions, or require further testing assistance, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	4.5	19.5	14.7	31.0	22.3	6.4	1.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	98.3	100	X
3/4"	95.5		
1/2"	92.8		
3/8"	90.0		
#4	76.0		
#10	61.3	97-100	X
#20	43.6	94-100	X
#40	30.3	81-93	X
#50	24.4		
#60	21.4		
#100	14.5	40-55	X
#200	8.0	22-39	X
0.05mm	6.3		
0.02mm	3.9		
0.002mm	1.6	7-18	X

* Andover Ledge Road SLF - Topsoil

Material Description

Black 1.5" max sand/organics some gravel trace silt
USDA Textural Classification = Sand (not specified Sandy Loam)

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 7.2817 D_{60}= 1.8655 D_{50}= 1.1557
D_{30}= 0.4180 D_{15}= 0.1571 D_{10}= 0.0967
C_u= 19.29 C_c= 0.97

Classification

USCS= SP-SM AASHTO= A-1-b

Remarks

Sample submitted by client 8/23/24
pH = 6.3, within project limits of 5.5-7
Organic = 11.6%, over project range 8-10

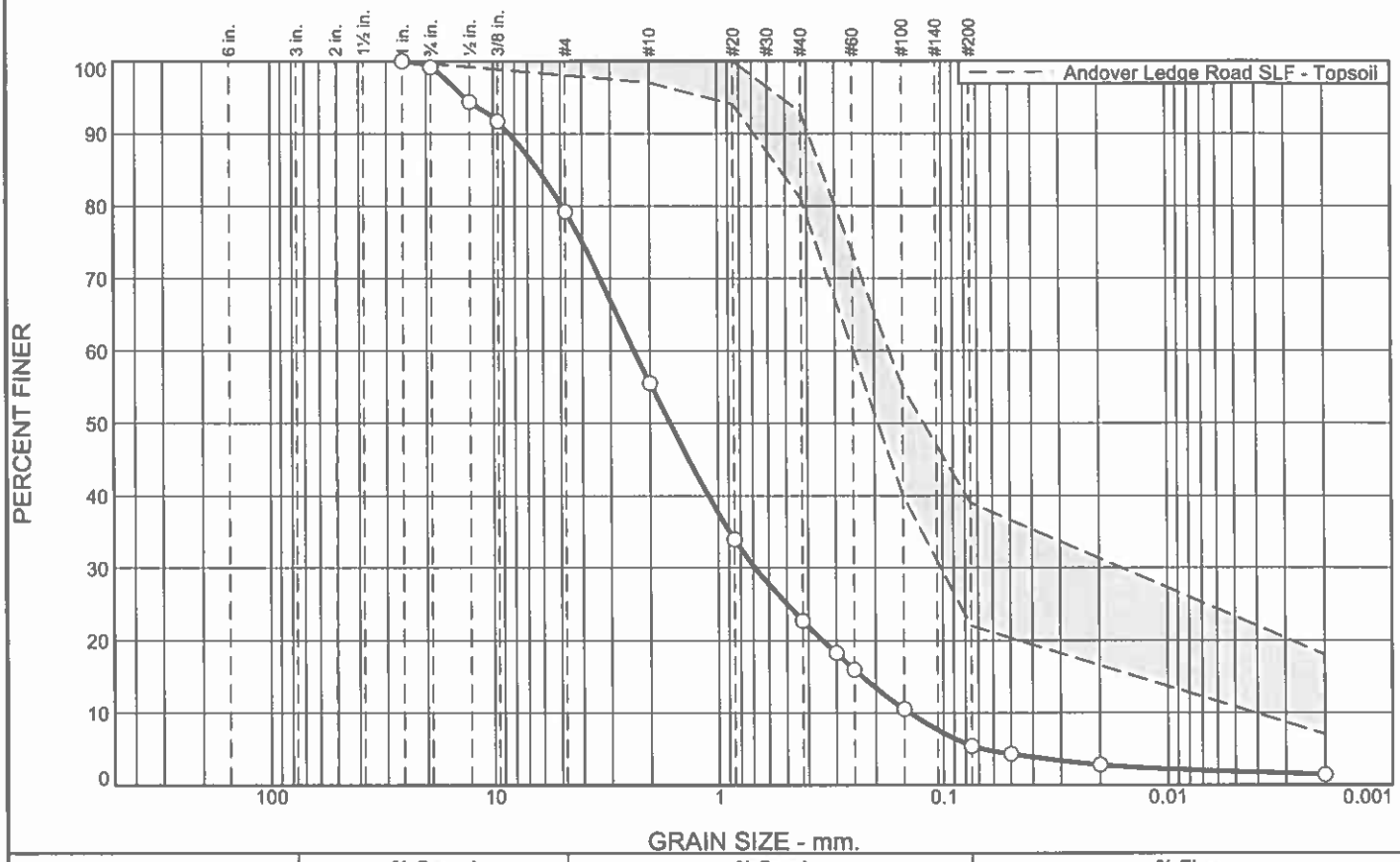
Sample No.: L35082 **Source of Sample:** Andover SLF **Date:** 8/30/24
Location: Screened topsoil **Elev./Depth:** 3000cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.8	20.0	23.7	32.8	17.3	4.0	1.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0	100	
3/4"	99.2		
1/2"	94.4		
3/8"	91.7		
#4	79.2		
#10	55.5	97-100	X
#20	34.0	94-100	X
#40	22.7	81-93	X
#50	18.3		
#60	15.9		
#100	10.5	40-55	X
#200	5.4	22-39	X
0.05mm	4.3		
0.02mm	2.8		
0.002mm	1.4	7-18	X

* Andover Ledge Road SLF - Topsoil

Material Description

Black 1" max sand/organics some gravel trace silt
USDA Textural Classification = Sand (not specified Sandy Loam)

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 6.2885 D_{60}= 2.3543 D_{50}= 1.6251
D_{30}= 0.6880 D_{15}= 0.2304 D_{10}= 0.1418
C_u= 16.60 C_c= 1.42

Classification

USCS= SW-SM AASHTO= A-1-b

Remarks

Sample submitted by client 8/23/24
pH = 6.5, within project limits of 5.5-7
Organic = 15.5%, over project range 8-10

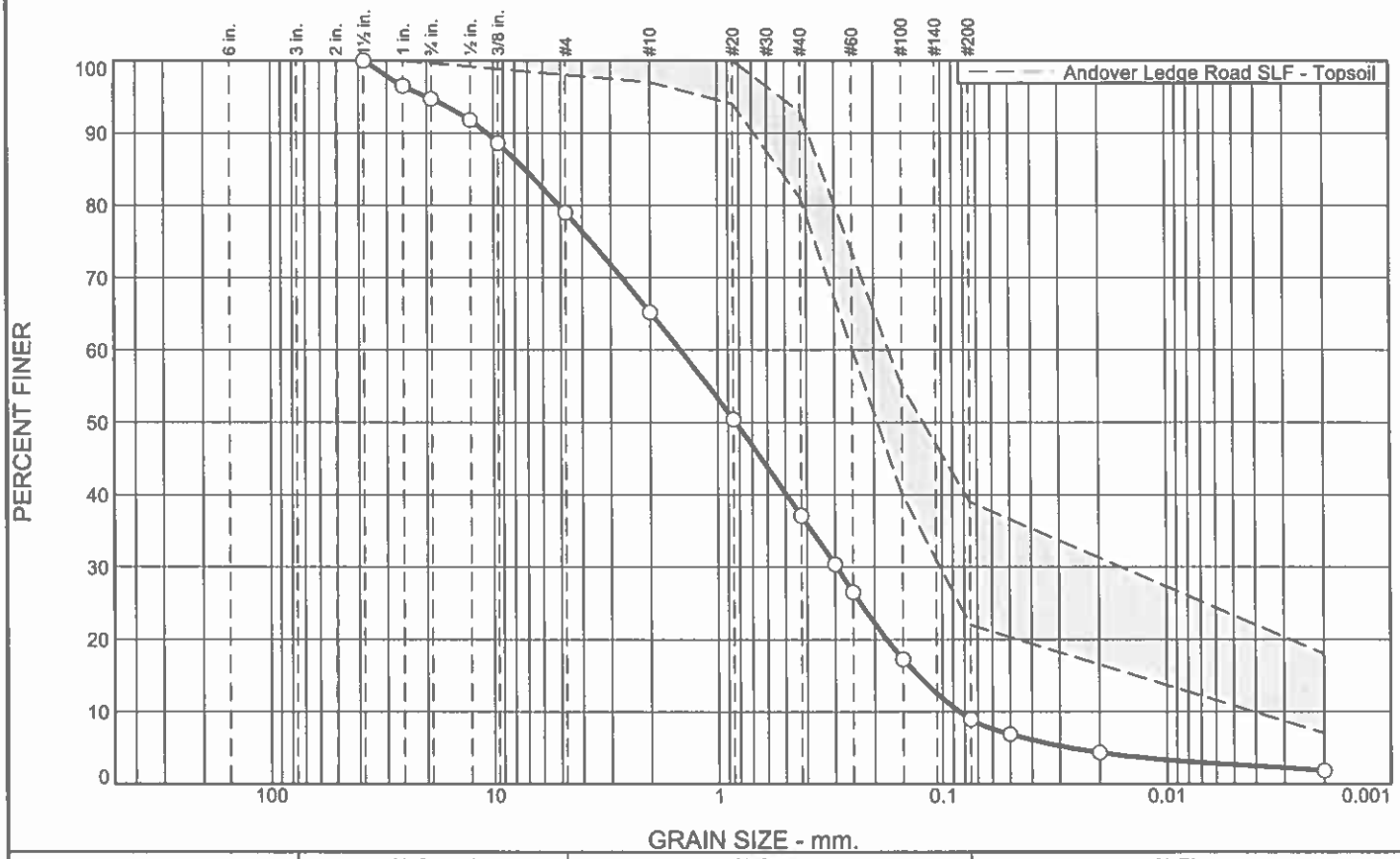
Sample No.: L35083 **Source of Sample:** Andover SLF **Date:** 8/30/24
Location: Screened topsoil **Elev./Depth:** 4000cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	5.3	15.7	13.8	28.1	28.2	7.1	1.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5"	100.0		
1"	96.5	100	X
3/4"	94.7		
1/2"	91.8		
3/8"	88.6		
#4	79.0		
#10	65.2	97-100	X
#20	50.4	94-100	X
#40	37.1	81-93	X
#50	30.4		
#60	26.5		
#100	17.2	40-55	X
#200	8.9	22-39	X
0.05mm	6.9		
0.02mm	4.3		
0.002mm	1.8	7-18	X

* Andover Ledge Road SLF - Topsoil

Material Description

Black 1.5" max sand/organics little gravel trace silt
USDA Textural Classification = Sand (not specified Sandy Loam)

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 7.2229 D_{60}= 1.4674 D_{50}= 0.8323
D_{30}= 0.2948 D_{15}= 0.1285 D_{10}= 0.0843
C_u= 17.41 C_c= 0.70

Classification

USCS= SP-SM AASHTO= A-1-b

Remarks

Sample submitted by client 8/23/24
pH = 6.5, within project limits of 5.5-7
Organic = 10.7%, over project range 8-10

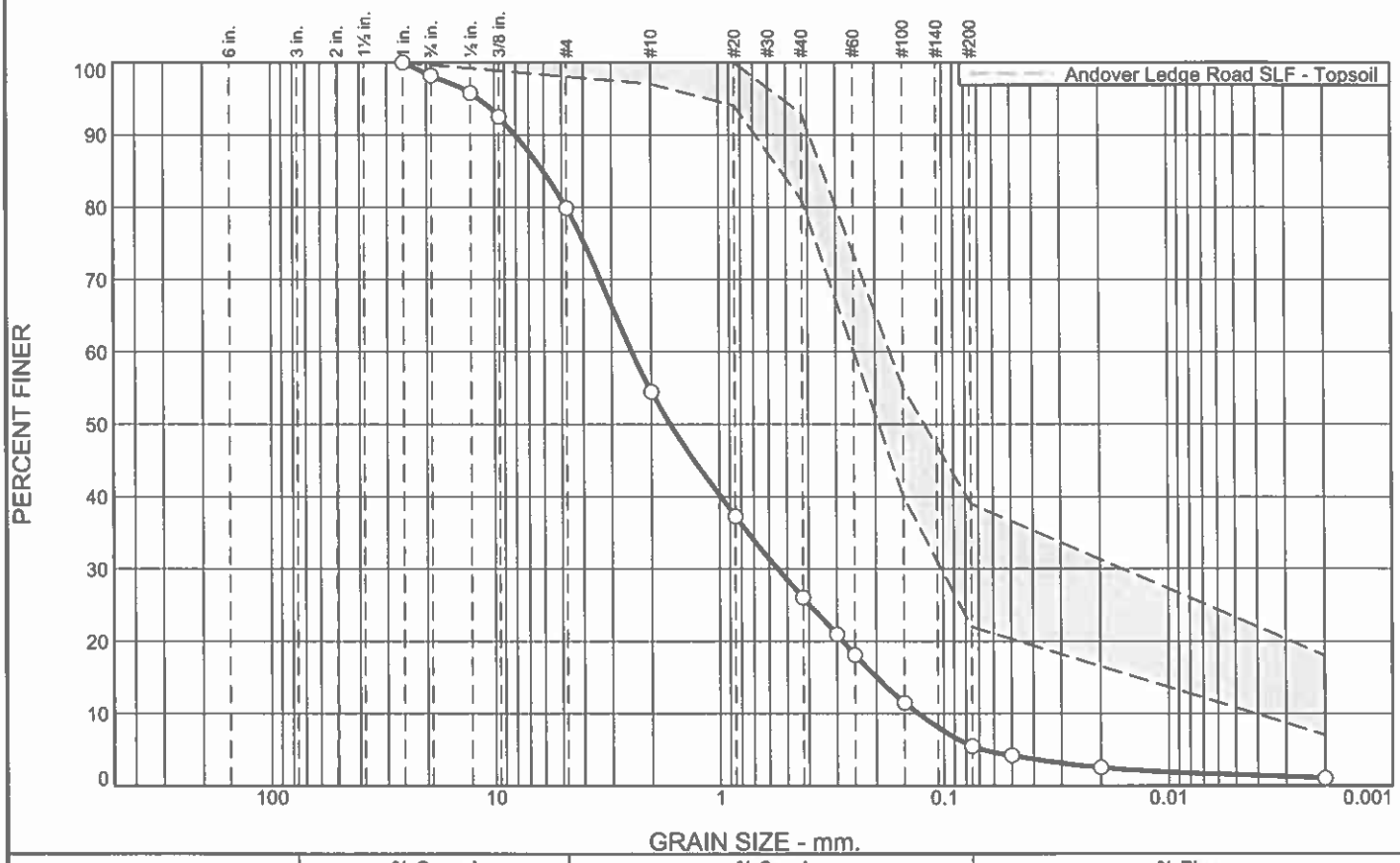
Sample No.: L35084 **Source of Sample:** Andover SLF **Date:** 8/30/24
Location: Screened topsoil **Elev./Depth:** 5000cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	1.8	18.3	25.4	28.5	20.5	4.4	1.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0	100	
3/4"	98.2		
1/2"	95.8		
3/8"	92.5		
#4	79.9		
#10	54.5	97-100	X
#20	37.3	94-100	X
#40	26.0	81-93	X
#50	21.0		
#60	18.1		
#100	11.5	40-55	X
#200	5.5	22-39	X
0.05mm	4.2		
0.02mm	2.5		
0.002mm	1.1	7-18	X

* Andover Ledge Road SLF - Topsoil

Material Description

Black 1" max m/f sand/organics some gravel trace silt
USDA Textural Classification = Sand (not specified Sandy Loam)

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 6.0483 D_{60}= 2.4418 D_{50}= 1.6479
D_{30}= 0.5496 D_{15}= 0.1997 D_{10}= 0.1301
C_u= 18.77 C_c= 0.95

Classification

USCS= SP-SM AASHTO= A-1-b

Remarks

Sample submitted by client 8/23/24
pH = 6.6, within project limits of 5.5-7
Organic = 10.1%, over project range 8-10

Sample No.: L35085 **Source of Sample:** Andover SLF **Date:** 8/30/24
Location: Screened topsoil **Elev./Depth:** 6000cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

September 19, 2024

Mr. John Bates
J. Bates & Son LLC
57 Lawrence Street
Clinton, MA 01510

RE: Topsoil Laboratory Test Results
Andover SLF – Topsoil, 7000cy sample
Andover, Massachusetts **Project # 26023**

Dear Mr. Bates:

We submit herein the results of pH, organic content, macro-nutrient, and gradation (including hydrometer) analyses (after burning) completed on topsoil sample **L-35183**, submitted September 11, 2024 and stated to represent above source. The gradation and organic tests were completed per ASTM D-422 & D-2974, while the nutrient tests were in accordance with the standard LaMotte procedures. The lab results and conclusions ("Topsoil" job's limits listed) are summarized below:

pH = 7.2, Close to neutral, close to job's "topsoil" limits of 5.5 to 7.0
Organic Content = 12.2 %, very good, over the 8% to 10% "topsoil" job's limits
Nitrogen, N = 150 lb./acre good, minimal additional nitrogen suggested
Phosphorus, P = 200 lb./acre good, minimal additional phosphorus suggested
Potash, K = 300 lb./acre good, minimal additional potassium suggested

USDA Sizing	Gravel (>#10)	Sand (#10 to .05)	Silt (<.05 to >002)	Clay (<.002)
Total Gradation:	40	44	15	1
Sand Fraction:	0	73	25	2

"Topsoil" job limits gradation specifications:

Sieve	1" (50 mm)	#10 (2.00 mm)	#20 (850µm)	#40 (425µm)	#100 (150 µm)	#200 (75 µm)	0.002mm (2 µm)
Spec Range	100	97 - 100	94 - 100	81 - 93	40 - 55	22 - 39	7 - 18
% Passing	100	60%*	54%*	47%*	30%*	21%*	1%*

USDA Textural (based on 100% < #10 sieve) Topsoil Classification = Loamy Sand, did not met "Sandy Loam" requirement

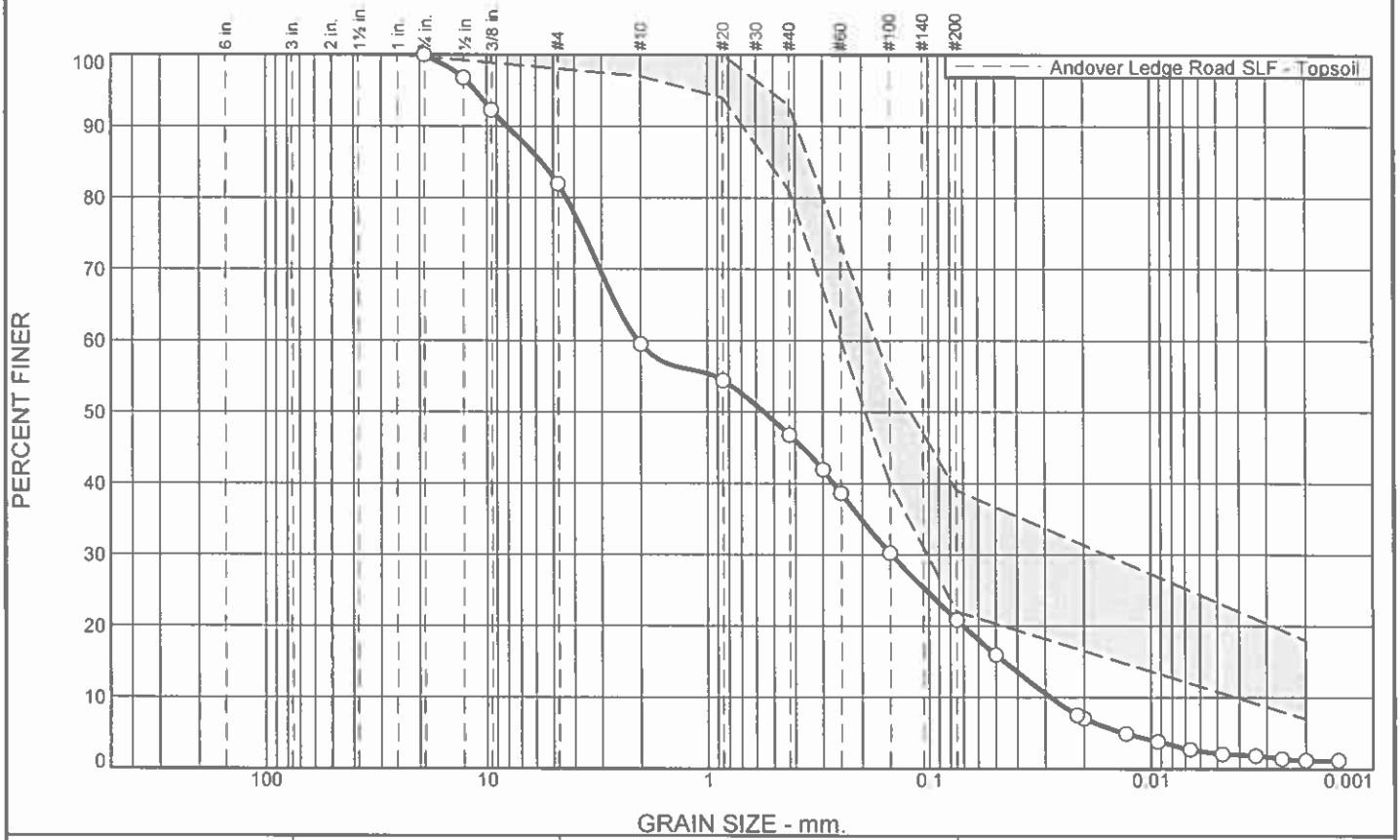
We believe that you will find this information, and the attached gradation curve, helpful in evaluating the material. Should you have any questions, or require further testing assistance, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	18.1	22.4	12.7	26.0	19.6	1.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3/4"	100.0		
1/2"	96.8		
3/8"	92.3		
#4	81.9		
#10	59.5	97-100	X
#20	54.4	94-100	X
#40	46.8	81-93	X
#50	41.9		
#60	38.6		
#100	30.2	40-55	X
#200	20.8	22-39	X
0.05mm	16.0		
0.02mm	7.0		
0.002mm	1.2	7-18	X

* Andover Ledge Road SLF - Topsoil

Material Description

Black 3/4" max silty sand/organics little gravel
USDA Textural Classification = Loamy Sand (not specified Sandy Loam)

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 5.6360 D_{60}= 2.0629 D_{50}= 0.5545
D_{30}= 0.1477 D_{15}= 0.0458 D_{10}= 0.0283
C_u= 72.82 C_c= 0.37

Classification

USCS= SM AASHTO= A-1-b

Remarks

Sample submitted by client 09/11/24
pH = 7.2, over the project limits of 5.5-7
Organic =12.2%, over the project range 8-10

Sample No.: L-35183A **Source of Sample:** Andover SLF **Date:** 9/19/24
Location: Screened topsoil (after burning) **Elev./Depth:** 7000cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK / AH **Checked By:** SMM

Yankee Engineering & Testing, Inc.

September 19, 2024

Mr. John Bates
J. Bates & Son LLC
57 Lawrence Street
Clinton, MA 01510

RE: Topsoil Laboratory Test Results
Andover SLF – Topsoil, 8000cy sample
Andover, Massachusetts **Project # 26023**

Dear Mr. Bates:

We submit herein the results of pH, organic content, macro-nutrient, and gradation (including hydrometer) analyses completed after burning on topsoil sample **L-35184A**, submitted September 11, 2024 and stated to represent above source. The gradation and organic tests were completed per ASTM D-422 & D-2974, while the nutrient tests were in accordance with the standard LaMotte procedures. The lab results and conclusions ("Topsoil" job's limits listed) are summarized below:

pH = 7.5, Close to neutral, out of the job's "topsoil" limits of 5.5 to 7.0
Organic Content = 15.0 %, very good, over the 8% to 10% "topsoil" job's limits
Nitrogen, N = 150 lb./acre good, minimal additional nitrogen suggested
Phosphorus, P = 200 lb./acre good, minimal additional phosphorus suggested
Potash, K = 300 lb./acre good, minimal additional potassium suggested

USDA Sizing	Gravel (>#10)	Sand (#10 to .05)	Silt (<.05 to >002)	Clay (<.002)
Total Gradation:	48	38	13	1
Sand Fraction:	0	73	25	2

"Topsoil" job limits gradation specifications:

Sieve	1" (50 mm)	#10 (2.00 mm)	#20 (850µm)	#40 (425µm)	#100 (150 µm)	#200 (75 µm)	0.002mm (2 µm)
Spec Range	100	97 - 100	94 - 100	81 - 93	40 - 55	22 - 39	7 - 18
% Passing	100	52%*	47%*	40%*	26%*	18%*	1%*

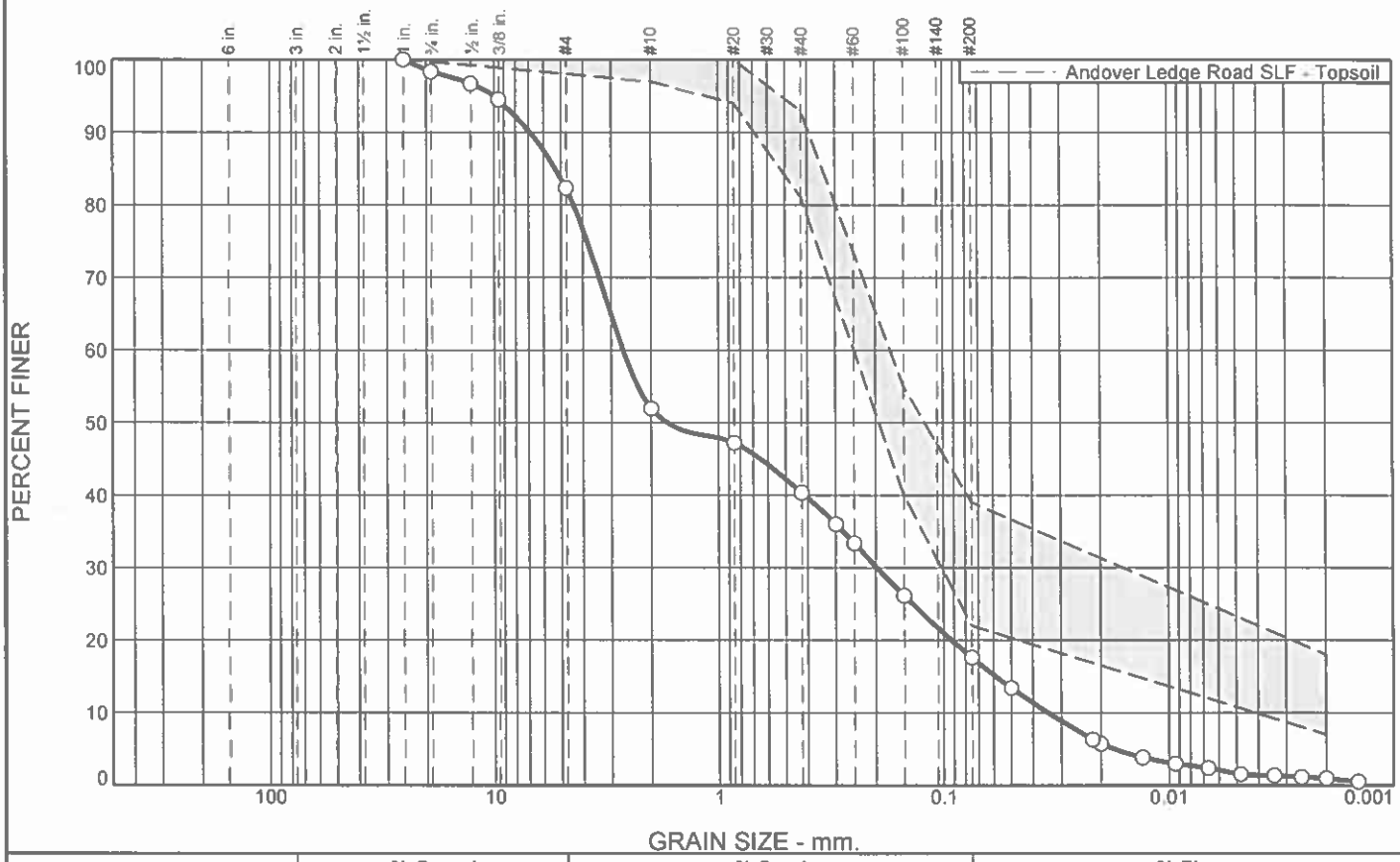
USDA Textural (based on 100% < #10 sieve) Topsoil Classification = Loamy Sand, did not met "Sandy Loam" requirement

We believe that you will find this information, and the attached gradation curve, helpful in evaluating the material. Should you have any questions, or require further testing assistance, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	1.7	16.0	30.4	11.6	22.7	16.7	0.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0	100	
3/4"	98.3		
1/2"	96.7		
3/8"	94.5		
#4	82.3		
#10	51.9	97-100	X
#20	47.2	94-100	X
#40	40.3	81-93	X
#50	36.0		
#60	33.4		
#100	26.1	40-55	X
#200	17.6	22-39	X
0.05mm	13.4		
0.02mm	5.7		
0.002mm	0.9	7-18	X

* Andover Ledge Road SLF - Topsoil

Material Description

Black 1" max m/f sand/organics little gravel trace silt
USDA Textural Classification = Loamy Sand (not specified Sandy Loam)

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 5.3018 D_{60}= 2.6602 D_{50}= 1.7045
D_{30}= 0.1977 D_{15}= 0.0588 D_{10}= 0.0343
C_u= 77.67 C_c= 0.43

Classification

USCS= SM AASHTO= A-1-b

Remarks

Sample submitted by client 09/11/24
pH = 7.5, out of project limits of 5.5-7
Organic = 15.0%, over project range 8%-10%

Sample No.: L35184A **Source of Sample:** Andover SLF **Date:** 9/19/24
Location: Screened topsoil (after burning) **Elev./Depth:** 8000cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK / AH **Checked By:** SMM

Yankee Engineering & Testing, Inc.

September 19, 2024

Mr. John Bates
J. Bates & Son LLC
57 Lawrence Street
Clinton, MA 01510

RE: Topsoil Laboratory Test Results
Andover SLF – Topsoil, 9000cy sample
Andover, Massachusetts **Project # 26023**

Dear Mr. Bates:

We submit herein the results of pH, organic content, macro-nutrient, and gradation (including hydrometer) analyses completed after burning on topsoil sample **L-35185A**, submitted September 11, 2024 and stated to represent above source. The gradation and organic tests were completed per ASTM D-422 & D-2974, while the nutrient tests were in accordance with the standard LaMotte procedures. The lab results and conclusions ("Topsoil" job's limits listed) are summarized below:

pH = 7.0, neutral, met the job's "topsoil" limits of 5.5 to 7.0
Organic Content = 9.2 %, very good, met the 8% to 10% "topsoil" job's limits
Nitrogen, N = 100 lb./acre good, minimal additional nitrogen suggested
Phosphorus, P = 200 lb./acre good, minimal additional phosphorus suggested
Potash, K = 300 lb./acre good, minimal additional potassium suggested

USDA Sizing	Gravel (>#10)	Sand (#10 to .05)	Silt (<.05 to >002)	Clay (<.002)
Total Gradation:	31	50	18	1
Sand Fraction:	0	74	25	1

"Topsoil" job limits gradation specifications:

Sieve	1" (50 mm)	#10 (2.00 mm)	#20 (850µm)	#40 (425µm)	#100 (150 µm)	#200 (75 µm)	0.002mm (2 µm)
Spec Range	100	97 - 100	94 - 100	81 - 93	40 - 55	22 - 39	7 - 18
% Passing	100	69%*	63%*	54%*	35%*	24%*	1%*

USDA Textural (based on 100% < #10 sieve) Topsoil Classification = Loamy Sand, did not met "Sandy Loam" requirement

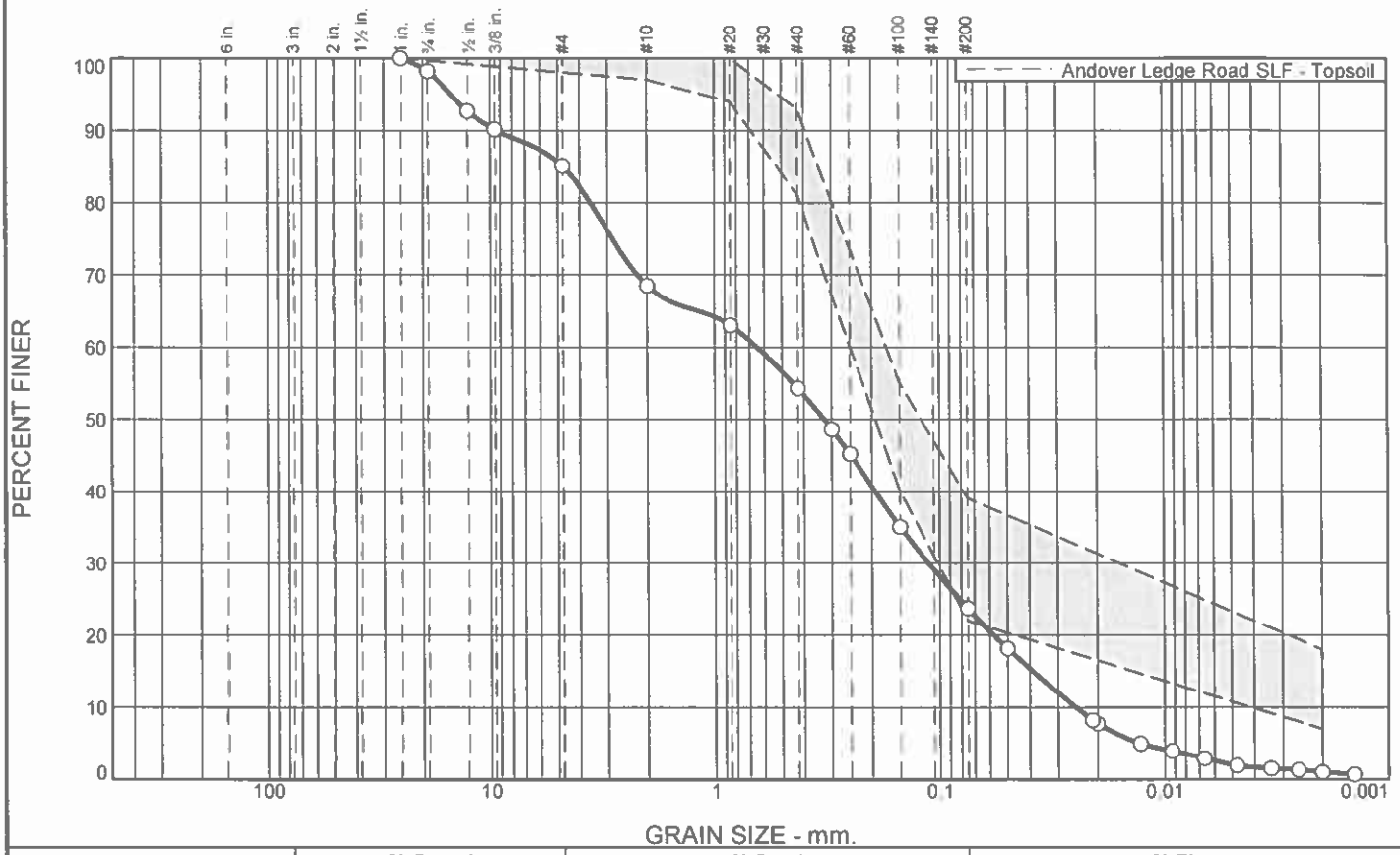
We believe that you will find this information, and the attached gradation curve, helpful in evaluating the material. Should you have any questions, or require further testing assistance, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	1.8	13.1	16.6	14.2	30.6	22.7	1.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0	100	
3/4"	98.2		
1/2"	92.7		
3/8"	90.2		
#4	85.1		
#10	68.5	97-100	X
#20	63.0	94-100	X
#40	54.3	81-93	X
#50	48.6		
#60	45.1		
#100	35.0	40-55	X
#200	23.7	22-39	
0.05mm	18.1		
0.02mm	7.7		
0.002mm	1.0	7-18	X

* Andover Ledge Road SLF - Topsoil

Material Description

Black 1" max silty sand/organics little gravel
USDA Textural Classification = Loamy Sand (not specified Sandy Loam)

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 4.7143 D_{60}= 0.6481 D_{50}= 0.3257
D_{30}= 0.1119 D_{15}= 0.0387 D_{10}= 0.0250
C_u= 25.94 C_c= 0.77

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

Sample submitted by client 09/11/24
pH = 7.0, within project limits of 5.5-7
Organic = 9.2 %, met range 8%-10% limits

Sample No.: L35185A **Source of Sample:** Andover SLF **Date:** 9/19/24
Location: Screened topsoil (after burning) **Elev./Depth:** 9000cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK / AH **Checked By:** SMM

Yankee Engineering & Testing, Inc.

September 19, 2024

Mr. John Bates
J. Bates & Son LLC
57 Lawrence Street
Clinton, MA 01510

RE: Topsoil Laboratory Test Results
Andover SLF – Topsoil, 10000cy sample
Andover, Massachusetts **Project # 26023**

Dear Mr. Bates:

We submit herein the results of pH, organic content, macro-nutrient, and gradation (including hydrometer) analyses completed after burning on topsoil sample **L-35186A**, submitted September 11, 2024 and stated to represent above source. The gradation and organic tests were completed per ASTM D-422 & D-2974, while the nutrient tests were in accordance with the standard LaMotte procedures. The lab results and conclusions ("Topsoil" job's limits listed) are summarized below:

pH = 6.5, close to neutral, met the job's "topsoil" limits of 5.5 to 7.0
Organic Content = 10.3 %, very good, over the 8% to 10% "topsoil" job's limits
Nitrogen, N = 150 lb./acre good, minimal additional nitrogen suggested
Phosphorus, P = 200 lb./acre good, minimal additional phosphorus suggested
Potash, K = 300 lb./acre good, minimal additional potassium suggested

USDA Sizing	Gravel (>#10)	Sand (#10 to .05)	Silt (<.05 to >002)	Clay (<.002)
Total Gradation:	22	57	20	1
Sand Fraction:	0	73	26	1

"Topsoil" job limits gradation specifications:

Sieve	1" (50 mm)	#10 (2.00 mm)	#20 (850µm)	#40 (425µm)	#100 (150 µm)	#200 (75 µm)	0.002mm (2 µm)
Spec Range	100	97 - 100	94 - 100	81 - 93	40 - 55	22 - 39	7 - 18
% Passing	100	78%*	72%*	62%*	40%*	27%*	1%*

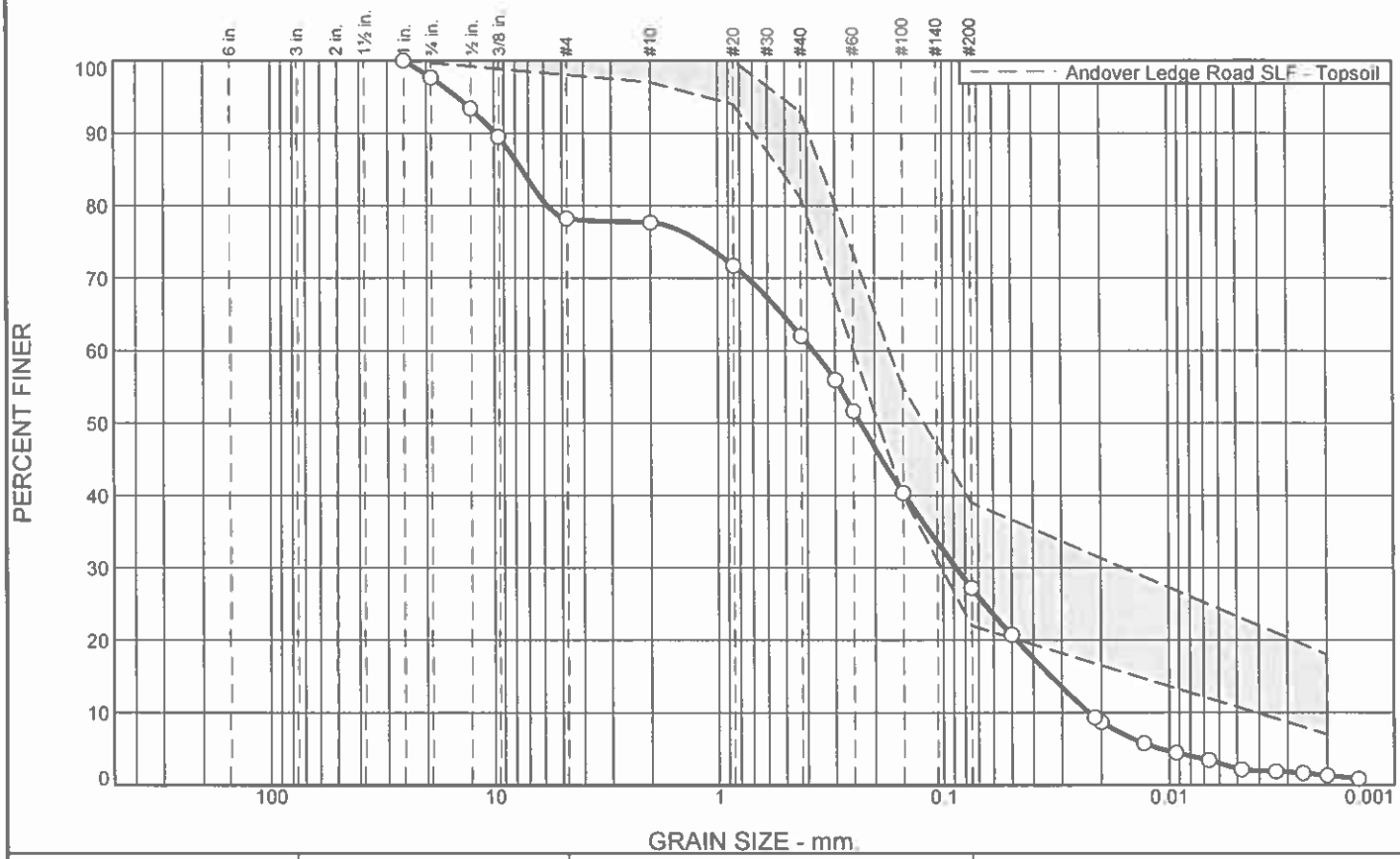
USDA Textural (based on 100% < #10 sieve) Topsoil Classification = Loamy Sand, did not met "Sandy Loam" requirement

We believe that you will find this information, and the attached gradation curve, helpful in evaluating the material. Should you have any questions, or require further testing assistance, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	2.3	19.5	0.5	15.7	34.8	25.9	1.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0	100	
3/4"	97.7		
1/2"	93.4		
3/8"	89.5		
#4	78.2		
#10	77.7	97-100	X
#20	71.7	94-100	X
#40	62.0	81-93	X
#50	55.9		
#60	51.7		
#100	40.4	40-55	
#200	27.2	22-39	
0.05mm	20.7		
0.02mm	8.7		
0.002mm	1.3	7-18	X

* Andover Ledge Road SLF - Topsoil

Material Description

Black 1" max silty sand/organics some gravel
USDA Textural Classification = Loamy Sand (not specified Sandy Loam)

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 7.5089 D_{60}= 0.3751 D_{50}= 0.2324
D_{30}= 0.0876 D_{15}= 0.0335 D_{10}= 0.0227
C_u= 16.55 C_c= 0.90

Classification

USCS= SM AASHTO= A-2-4(0)

Remarks

Sample submitted by client 09/11/24
pH = 6.5, within project limits of 5.5-7
Organic = 10.3%, over the project range 8-10

Sample No.: L35186A **Source of Sample:** Andover SLF **Date:** 9/19/24
Location: Screened topsoil (after burning) **Elev./Depth:** 10.000cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK / AH **Checked By:** SMM

Yankee Engineering & Testing, Inc.

October 10, 2024

Mr. John Bates
J. Bates & Son LLC
57 Lawrence Street
Clinton, MA 01510

RE: Topsoil Laboratory Test Results
Andover SLF – Topsoil, 11000cy sample
Andover, Massachusetts **Project # 26023**

Dear Mr. Bates.

We submit herein the results of pH, organic content, macro-nutrient, and gradation (#200 sieve) analyses completed on topsoil sample **L-35330**, submitted October 3, 2024 and stated to represent above source. The gradation and organic tests were completed per ASTM D-422 & D-2974, while the nutrient tests were in accordance with the standard LaMotte procedures. The lab results and conclusions ("Topsoil" job's limits listed) are summarized below:

pH = 6.8, close to neutral, met the job's "topsoil" limits of 5.5 to 7.0
Organic Content = 9.6 %, good, met the 8% to 10% "topsoil" job's limits
Nitrogen, N = 100 lb./acre good, minimal additional nitrogen suggested
Phosphorus, P = 200 lb./acre good, minimal additional phosphorus suggested
Potash, K = 150 lb./acre fair, little additional potassium suggested

USDA Sizing	Gravel (>#10)	Sand (#10 to .05)	Silt (<.05 to >002)	Clay (<.002)
Total Gradation:	31	64	4	1
Sand Fraction:	0	93	6	1

"Topsoil" job limits gradation specifications:

Sieve	1" (50 mm)	#10 (2.00 mm)	#20 (850µm)	#40 (425µm)	#100 (150 µm)	#200 (75 µm)	0.002mm (2 µm)
Spec Range	100	97 - 100	94 - 100	81 - 93	40 - 55	22 - 39	7 - 18
% Passing	99	69%*	54%*	37%*	13%*	6%*	1%*

USDA Textural (based on 100% < #10 sieve) Topsoil Classification = Sand, did not met "Sandy Loam" requirement
Observations: Sample was free of sticks, roots, and/or stones exceeding 2" (State max. allowable).

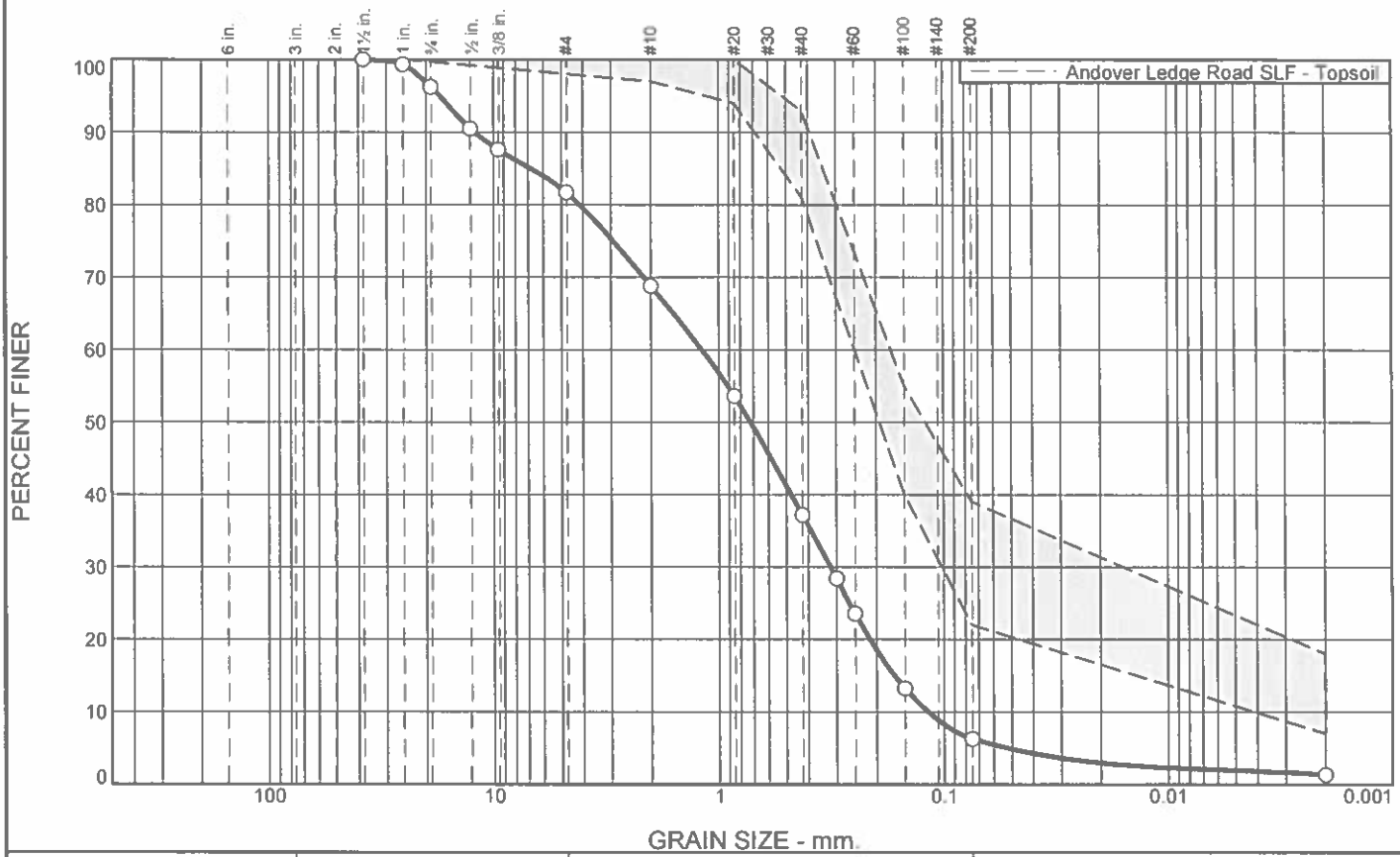
We believe that you will find this information, and the attached gradation curve, helpful in evaluating the material. Should you have any questions, or require further testing assistance, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	3.8	14.5	12.9	31.6	30.9	5.0	1.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	99.3	100	X
.75	96.2		
1/2"	90.5		
3/8"	87.6		
#4	81.7		
#10	68.8	97-100	X
#20	53.6	94-100	X
#40	37.2	81-93	X
#50	28.4		
#60	23.6		
#100	13.2	40-55	X
#200	6.3	22-39	X
0.002mm	1.3	7-18	X

* Andover Ledge Road SLF - Topsoil

Material Description

Brown 1.5" max sand/organics little gravel trace silt
USDA Textural Classification = SAND

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 6.8553 D_{60}= 1.1880 D_{50}= 0.7217
D_{30}= 0.3191 D_{15}= 0.1670 D_{10}= 0.1183
C_u= 10.04 C_c= 0.72

Classification

USCS= SP-SM AASHTO= A-1-b

Remarks

Sample was submitted by client on 10/03/24
Did not meet Andover topsoil gradation limits
See letter dated 10/10/24 for additional information

Sample No.: L35330 **Source of Sample:** Andover SLF **Date:** 10/10/24
Location: Onsite - Screened Loam **Elev./Depth:** 11.000 cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

October 10, 2024

Mr. John Bates
J. Bates & Son LLC
57 Lawrence Street
Clinton, MA 01510

RE: Topsoil Laboratory Test Results
Andover SLF – Topsoil, 12000cy sample
Andover, Massachusetts **Project # 26023**

Dear Mr. Bates.

We submit herein the results of pH, organic content, macro-nutrient, and gradation (#200 sieve) analyses completed on topsoil sample **L-35331**, submitted October 3, 2024 and stated to represent above source. The gradation and organic tests were completed per ASTM D-422 & D-2974, while the nutrient tests were in accordance with the standard LaMotte procedures. The lab results and conclusions ("Topsoil" job's limits listed) are summarized below:

pH = 6.7, close to neutral, met the job's "topsoil" limits of 5.5 to 7.0
Organic Content = 9.8 %, good, met the 8% to 10% "topsoil" job's limits
Nitrogen, N = 100 lb./acre good, minimal additional nitrogen suggested
Phosphorus, P = 200 lb./acre good, minimal additional phosphorus suggested
Potash, K = 150 lb./acre fair, little additional potassium suggested

USDA Sizing	Gravel (>#10)	Sand (#10 to .05)	Silt (<.05 to >002)	Clay (<.002)
Total Gradation:	31	64	4	1
Sand Fraction:	0	93	6	1

"Topsoil" job limits gradation specifications:

Sieve	1" (50 mm)	#10 (2.00 mm)	#20 (850µm)	#40 (425µm)	#100 (150 µm)	#200 (75 µm)	0.002mm (2 µm)
Spec Range	100	97 - 100	94 - 100	81 - 93	40 - 55	22 - 39	7 - 18
% Passing	100	69%*	55%*	39%*	15%*	7%*	2%*

USDA Textural (based on 100% < #10 sieve) Topsoil Classification = Sand, did not met "Sandy Loam" requirement
Observations: Sample was free of sticks, roots, and/or stones exceeding 2" (State max. allowable).

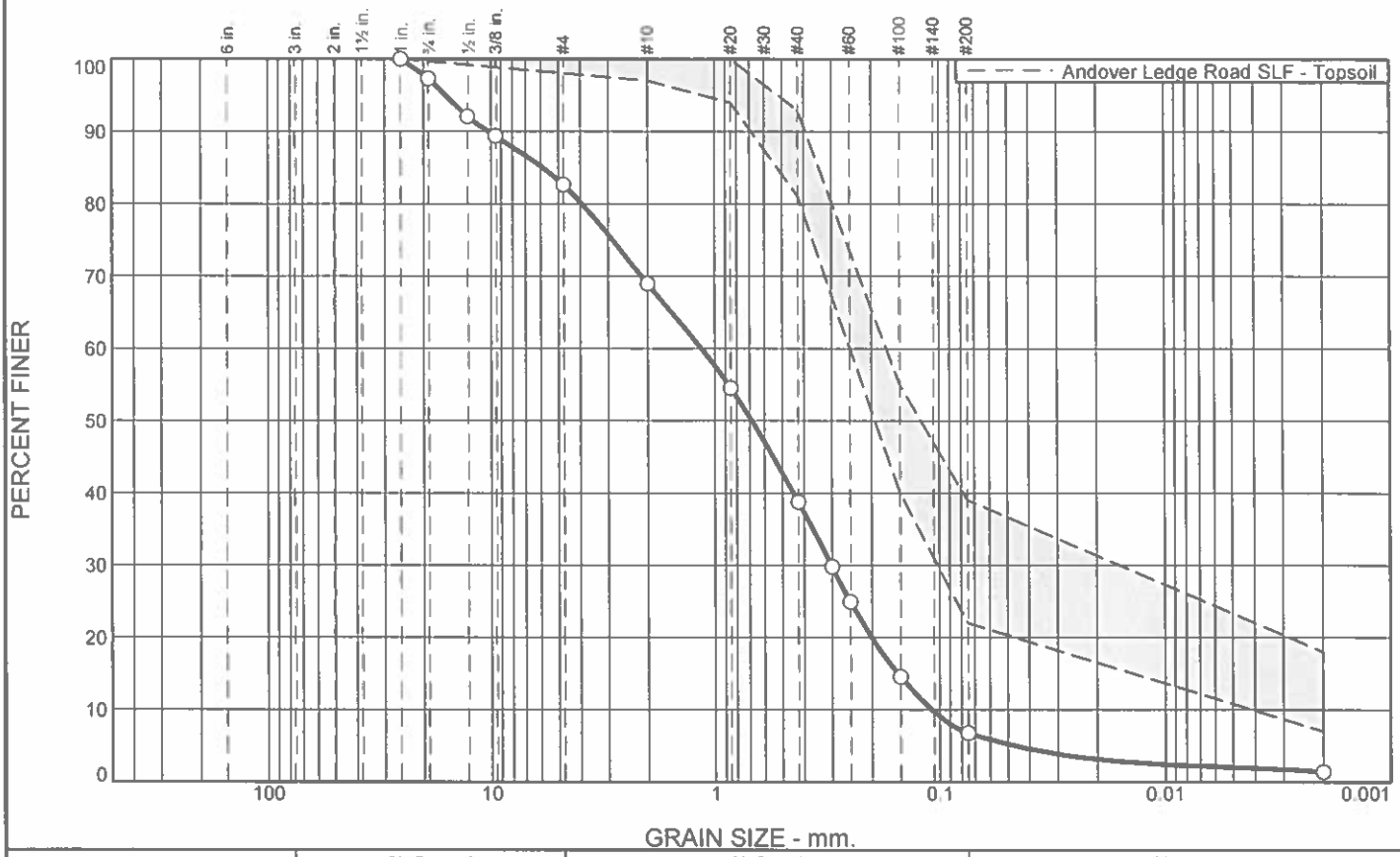
We believe that you will find this information, and the attached gradation curve, helpful in evaluating the material. Should you have any questions, or require further testing assistance, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	2.7	14.7	13.7	30.1	32.0	5.4	1.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1	100.0	100	
.75	97.3		
1/2"	92.1		
3/8"	89.4		
#4	82.6		
#10	68.9	97-100	X
#20	54.5	94-100	X
#40	38.8	81-93	X
#50	29.8		
#60	24.9		
#100	14.6	40-55	X
#200	6.8	22-39	X
0.002mm	1.4	7-18	X

* Andover Ledge Road SLF - Topsoil

Material Description

Brown 1" max sand/organics little gravel trace silt
USDA Textural Classification = SAND

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 5.8648 D_{60}= 1.1486 D_{50}= 0.6854
D_{30}= 0.3025 D_{15}= 0.1541 D_{10}= 0.1089
C_u= 10.55 C_c= 0.73

Classification

USCS= SP-SM AASHTO= A-1-b

Remarks

Sample was submitted by client on 10/03/24
Did not meet Andover topsoil gradation limits
See letter dated 10/10/24 for additional information

Sample No.: L35331 **Source of Sample:** Andover SLF **Date:** 10/10/24
Location: Onsite - Screened Loam **Elev./Depth:** 12.000 cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

October 10, 2024

Mr. John Bates
J. Bates & Son LLC
57 Lawrence Street
Clinton, MA 01510

RE: Topsoil Laboratory Test Results
Andover SLF – Topsoil, 13000cy sample
Andover, Massachusetts **Project # 26023**

Dear Mr. Bates;

We submit herein the results of pH, organic content, macro-nutrient, and gradation (#200 sieve) analyses completed on topsoil sample **L-35332**, submitted October 3, 2024 and stated to represent above source. The gradation and organic tests were completed per ASTM D-422 & D-2974, while the nutrient tests were in accordance with the standard LaMotte procedures. The lab results and conclusions ("Topsoil" job's limits listed) are summarized below:

pH = 7.0, neutral, met the job's "topsoil" limits of 5.5 to 7.0
Organic Content = 11.5 %, good, over the 8% to 10% "topsoil" job's limits
Nitrogen, N = 100 lb./acre good, minimal additional nitrogen suggested
Phosphorus, P = 200 lb./acre good, minimal additional phosphorus suggested
Potash, K = 300 lb./acre fair, little additional potassium suggested

USDA Sizing	Gravel (>#10)	Sand (#10 to .05)	Silt (<.05 to >002)	Clay (<.002)
Total Gradation:	36	59	4	1
Sand Fraction:	0	92	6	2

"Topsoil" job limits gradation specifications:

Sieve	1" (50 mm)	#10 (2.00 mm)	#20 (850µm)	#40 (425µm)	#100 (150 µm)	#200 (75 µm)	0.002mm (2 µm)
Spec Range	100	97 - 100	94 - 100	81 - 93	40 - 55	22 - 39	7 - 18
% Passing	99	64%*	51%*	37%*	13%*	6%*	1%*

USDA Textural (based on 100% < #10 sieve) Topsoil Classification = Sand, did not met "Sandy Loam" requirement
Observations: Sample was free of sticks, roots, and/or stones exceeding 2" (State max. allowable).

We believe that you will find this information, and the attached gradation curve, helpful in evaluating the material. Should you have any questions, or require further testing assistance, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
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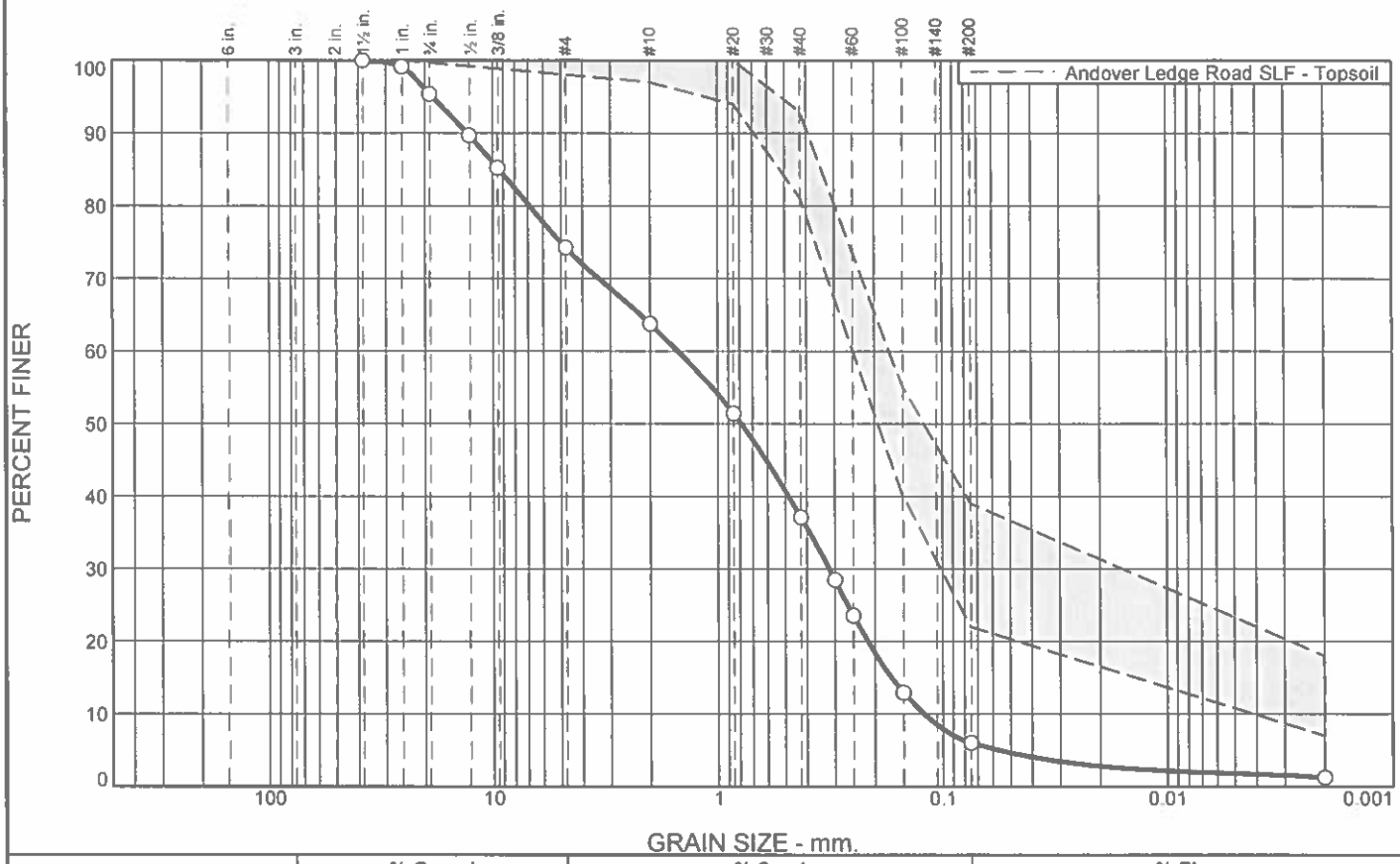
www.yankeeengineering.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	4.6	21.2	10.4	26.7	31.1	4.8	1.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	99.1	100	X
.75	95.4		
1/2"	89.7		
3/8"	85.2		
#4	74.2		
#10	63.8	97-100	X
#20	51.4	94-100	X
#40	37.1	81-93	X
#50	28.5		
#60	23.5		
#100	12.9	40-55	X
#200	6.0	22-39	X
0.002mm	1.2	7-18	X

* Andover Ledge Road SLF - Topsoil

Material Description

Brown 1.5" max sand/organics some gravel trace silt
USDA Textural Classification = SAND

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 9.3905 D_{60}= 1.5065 D_{50}= 0.7870
D_{30}= 0.3183 D_{15}= 0.1693 D_{10}= 0.1215
C_u= 12.40 C_c= 0.55

Classification

USCS= SP-SM AASHTO= A-1-b

Remarks

Sample was submitted by client on 10/03/24
Did not meet Andover Slf Topsoil gradation limits
See letter dated 10/10/24 for addititional information

Sample No.: L35332 **Source of Sample:** Andover SLF **Date:** 10/10/24
Location: Onsite - Screened Loam **Elev./Depth:** 13.000 cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

October 10, 2024

Mr. John Bates
J. Bates & Son LLC
57 Lawrence Street
Clinton, MA 01510

RE: Topsoil Laboratory Test Results
Andover SLF – Topsoil, 14000cy sample
Andover, Massachusetts **Project # 26023**

Dear Mr. Bates,

We submit herein the results of pH, organic content, macro-nutrient, and gradation (#200 sieve) analyses completed on topsoil sample **L-35333**, submitted October 3, 2024 and stated to represent above source. The gradation and organic tests were completed per ASTM D-422 & D-2974, while the nutrient tests were in accordance with the standard LaMotte procedures. The lab results and conclusions ("Topsoil" job's limits listed) are summarized below:

pH = 6.4, neutral, met the job's "topsoil" limits of 5.5 to 7.0
Organic Content = 7.7 %, less than the 8% to 10% "topsoil" job's limits
Nitrogen, N = 50 lb./acre fair, little additional nitrogen suggested
Phosphorus, P = 200 lb./acre good, minimal additional phosphorus suggested
Potash, K = 100 lb./acre low, some additional potassium suggested

USDA Sizing	Gravel (>#10)	Sand (#10 to .05)	Silt (<.05 to >002)	Clay (<.002)
Total Gradation:	36	59	4	1
Sand Fraction:	0	92	6	2

"Topsoil" job limits gradation specifications:

Sieve	1" (50 mm)	#10 (2.00 mm)	#20 (850µm)	#40 (425µm)	#100 (150 µm)	#200 (75 µm)	0.002mm (2 µm)
Spec Range	100	97 - 100	94 - 100	81 - 93	40 - 55	22 - 39	7 - 18
% Passing	98	68%*	51%*	31%*	11%*	5%*	1%*

USDA Textural (based on 100% < #10 sieve) Topsoil Classification = Sand, did not met "Sandy Loam" requirement
Observations: Sample was free of sticks, roots, and/or stones exceeding 2" (State max. allowable).

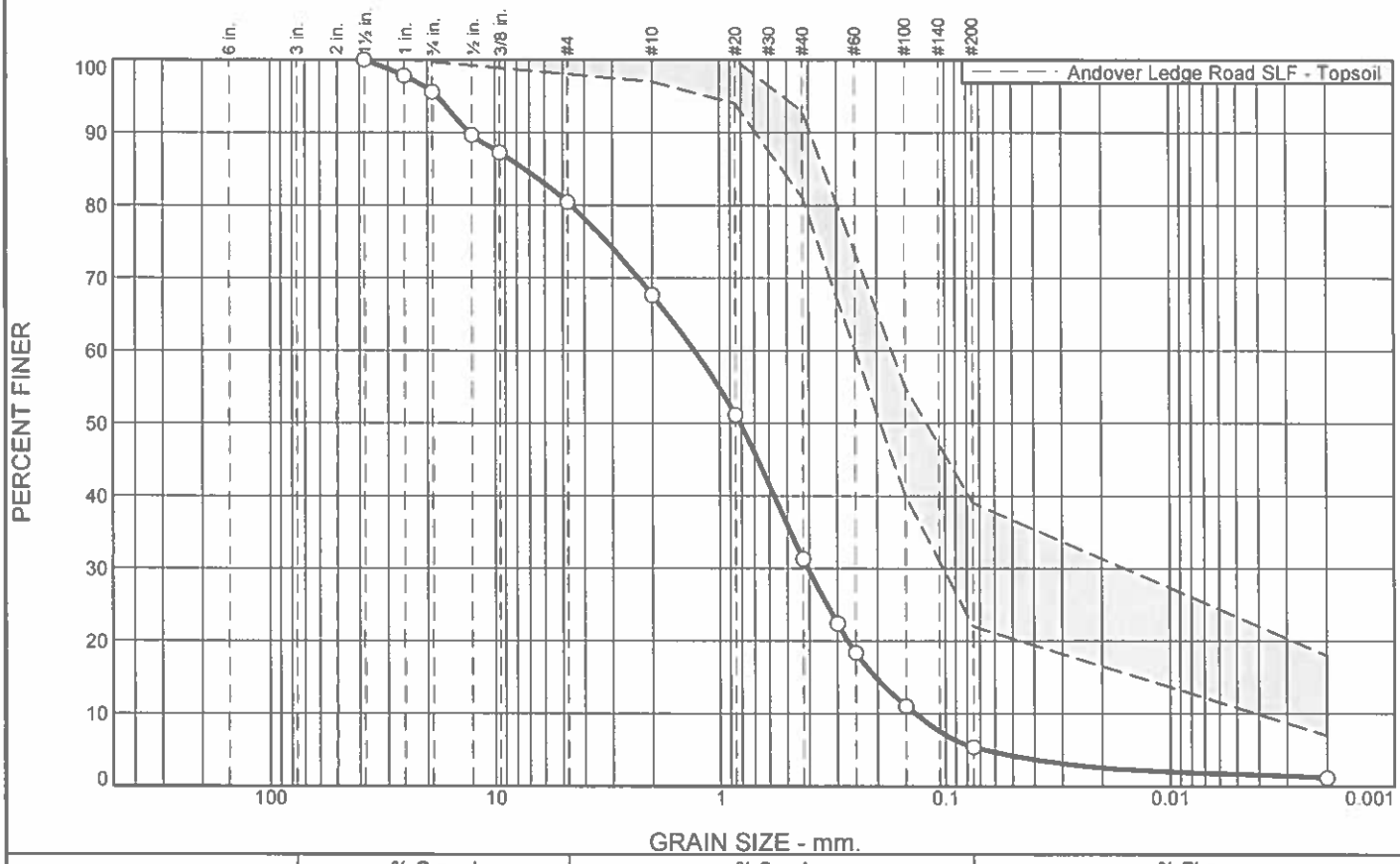
We believe that you will find this information, and the attached gradation curve, helpful in evaluating the material. Should you have any questions, or require further testing assistance, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	4.4	15.2	12.8	36.3	25.9	4.3	1.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	97.8	100	X
.75	95.6		
1/2"	89.6		
3/8"	87.2		
#4	80.4		
#10	67.6	97-100	X
#20	51.1	94-100	X
#40	31.3	81-93	X
#50	22.4		
#60	18.4		
#100	11.0	40-55	X
#200	5.4	22-39	X
0.002mm	1.1	7-18	X

* Andover Ledge Road SLF - Topsoil

Material Description

Brown 1.5" max sand/organics little gravel trace silt
USDA Textural Classification = SAND

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 7.4125 D_{60}= 1.2955 D_{50}= 0.8115
D_{30}= 0.4050 D_{15}= 0.2041 D_{10}= 0.1368
C_u= 9.47 C_c= 0.93

Classification

USCS= SP-SM AASHTO= A-1-b

Remarks

Sample was submitted by client on 10/03/24
Did not meet Andover SLF Topsoil gradation limits
See letter dated 10/10/24 for additional information

Sample No.: L35333 **Source of Sample:** Andover SLF **Date:** 10/10/24
Location: Onsite - Screened Loam **Elev./Depth:** 14.000 cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

October 10, 2024

Mr. John Bates
J. Bates & Son LLC
57 Lawrence Street
Clinton, MA 01510

RE: Topsoil Laboratory Test Results
Andover SLF – Topsoil, 15000cy sample
Andover, Massachusetts **Project # 26023**

Dear Mr. Bates,

We submit herein the results of pH, organic content, macro-nutrient, and gradation (#200 sieve) analyses completed on topsoil sample **L-35334**, submitted October 3, 2024 and stated to represent above source. The gradation and organic tests were completed per ASTM D-422 & D-2974, while the nutrient tests were in accordance with the standard LaMotte procedures. The lab results and conclusions ("Topsoil" job's limits listed) are summarized below:

pH = 6.2, neutral, met the job's "topsoil" limits of 5.5 to 7.0
Organic Content = 7.9 %, less than the 8% to 10% "topsoil" job's limits
Nitrogen, N = 40 lb./acre fair, little additional nitrogen suggested
Phosphorus, P = 200 lb./acre good, minimal additional phosphorus suggested
Potash, K = 100 lb./acre low, some additional potassium suggested

USDA Sizing	Gravel (>#10)	Sand (#10 to .05)	Silt (<.05 to >002)	Clay (<.002)
Total Gradation:	26	68	5	1
Sand Fraction:	0	92	7	1

"Topsoil" job limits gradation specifications:

Sieve	1" (50 mm)	#10 (2.00 mm)	#20 (850µm)	#40 (425µm)	#100 (150 µm)	#200 (75 µm)	0.002mm (2 µm)
Spec Range	100	97 - 100	94 - 100	81 - 93	40 - 55	22 - 39	7 - 18
% Passing	98	74%*	60%*	39%*	17%*	8%*	2%*

USDA Textural (based on 100% < #10 sieve) Topsoil Classification = Sand, did not met "Sandy Loam" requirement
Observations: Sample was free of sticks, roots, and/or stones exceeding 2" (State max. allowable).

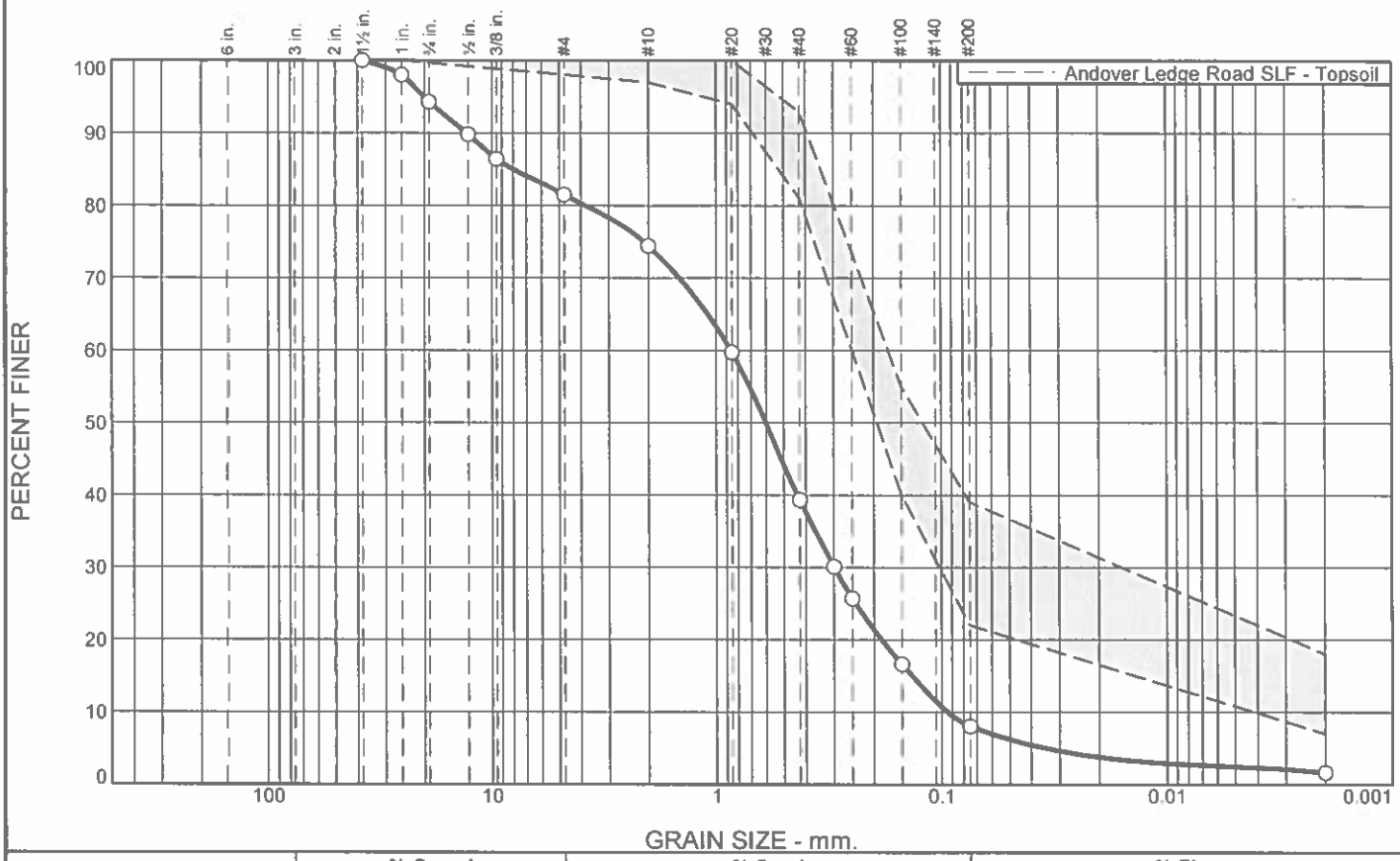
We believe that you will find this information, and the attached gradation curve, helpful in evaluating the material. Should you have any questions, or require further testing assistance, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	5.7	12.8	7.1	35.1	31.3	6.4	1.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1	98.0	100	X
.75	94.3		
1/2"	89.8		
3/8"	86.4		
#4	81.5		
#10	74.4	97-100	X
#20	59.7	94-100	X
#40	39.3	81-93	X
#50	30.1		
#60	25.7		
#100	16.6	40-55	X
#200	8.0	22-39	X
0.002mm	1.6	7-18	X

* Andover Ledge Road SLF - Topsoil

Material Description

Brown 1.5" max m/f sand/organics little gravel trace silt
USDA Textural Classification = SAND

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 8.0343 D_{60}= 0.8603 D_{50}= 0.6025
D_{30}= 0.2991 D_{15}= 0.1351 D_{10}= 0.0945
C_u= 9.10 C_c= 1.10

Classification

USCS= SW-SM AASHTO= A-1-b

Remarks

Sample was submitted by client on 10/03/24
Did not meet Andover Slf Topsoil gradation limits
See letter dated 10/10/24 for additional information

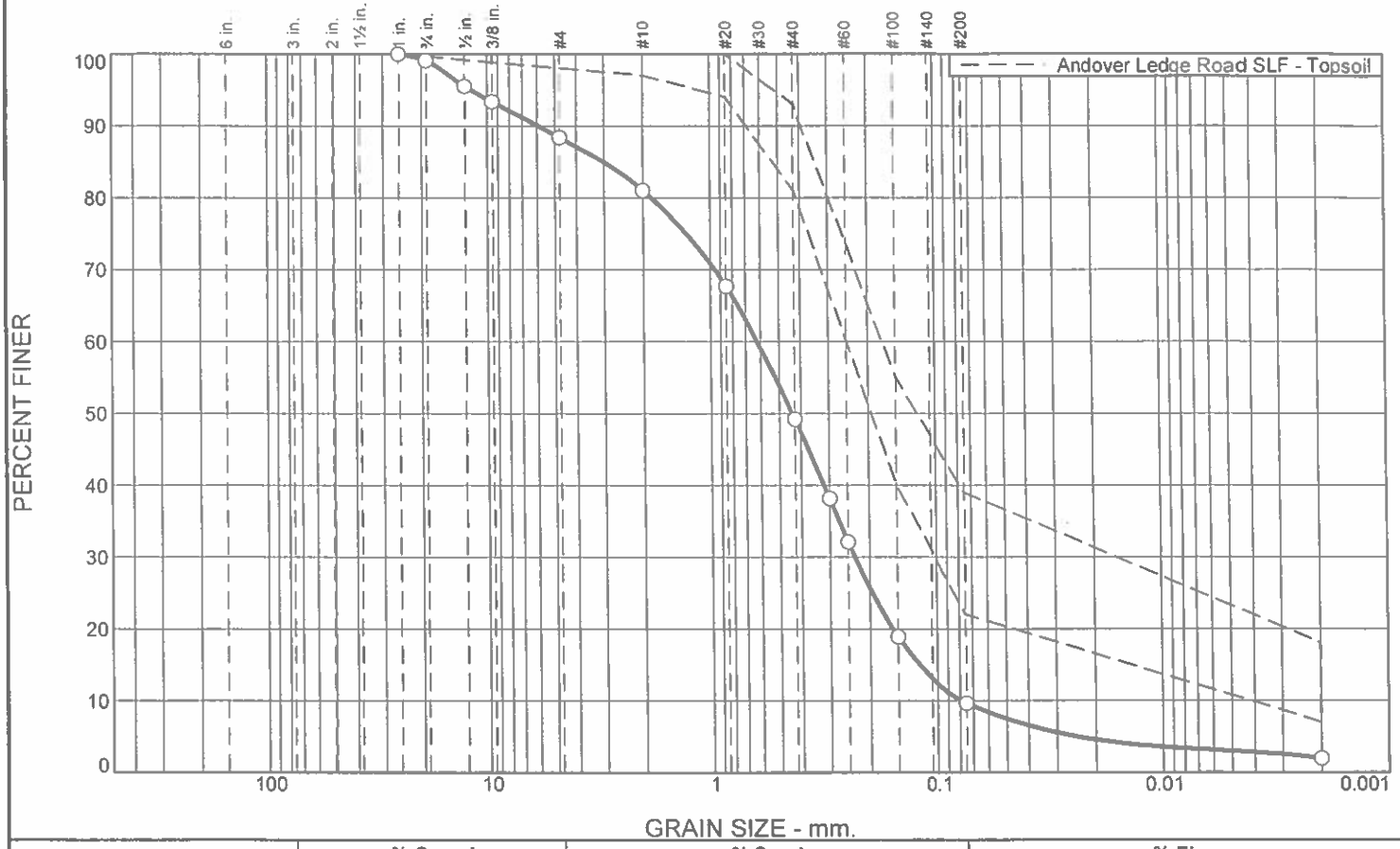
Sample No.: L35334 **Source of Sample:** Andover SLF **Date:** 10/10/24
Location: Onsite - Screened Loam **Elev./Depth:** 15.000 cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.9	10.7	7.4	31.8	39.6	7.7	1.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0	100	
3/4"	99.1		
1/2"	95.5		
3/8"	93.4		
#4	88.4		
#10	81.0	97-100	X
#20	67.7	94-100	X
#40	49.2	81-93	X
#50	38.2		
#60	32.1		
#100	18.9	40-55	X
#200	9.6	22-39	X
0.002mm	1.9	7-18	X

* Andover Ledge Road SLF - Topsoil

Material Description

Brown f/m sand/organics little gravel trace silt
USDA Textural Classification = Sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 3.0184 D_{60}= 0.6204 D_{50}= 0.4370
D_{30}= 0.2326 D_{15}= 0.1205 D_{10}= 0.0790
C_u= 7.85 C_c= 1.10

Classification

USCS= SW-SM AASHTO= A-1-b

Remarks

Sample submitted by client on 10/29/24
Did not meet Andover SLF Topsil gradation limits
See letterd ated 11/04/24 for additional information

Sample No.: L-35516 **Source of Sample:** Andover SLF **Date:** 11/4/24
Location: Loam **Elev./Depth:** 16.000 cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

November 4, 2024

Mr. John Bates
J. Bates & Son LLC
57 Lawrence Street
Clinton, MA 01510

RE: Topsoil Laboratory Test Results
Andover SLF – Topsoil, 16000cy sample
Andover, Massachusetts **Project # 26023**

Dear Mr. Bates,

We submit herein the results of pH, organic content, macro-nutrient, and gradation (#200 sieve) analyses completed on topsoil sample **L-35516**, submitted October 29, 2024 and stated to represent above source. The gradation and organic tests were completed per ASTM D-422 & D-2974, while the nutrient tests were in accordance with the standard LaMotte procedures. The lab results and conclusions ("Topsoil" job's limits listed) are summarized below:

pH = 6.4, neutral, met the job's "topsoil" limits of 5.5 to 7.0
Organic Content = 7.9 %, less than the 8% to 10% "topsoil" job's limits
Nitrogen, N = 60 lb./acre fair, little additional nitrogen suggested
Phosphorus, P = 200 lb./acre good, minimal additional phosphorus suggested
Potash, K = 100 lb./acre low, some additional potassium suggested

USDA Sizing	Gravel (>#10)	Sand (#10 to .05)	Silt (<.05 to >002)	Clay (<.002)
Total Gradation:	19	74	6	1
Sand Fraction:	0	91	8	1

"Topsoil" job limits gradation specifications:

Sieve	1" (50 mm)	#10 (2.00 mm)	#20 (850µm)	#40 (425µm)	#100 (150 µm)	#200 (75 µm)	0.002mm (2 µm)
Spec Range	100	97 - 100	94 - 100	81 - 93	40 - 55	22 - 39	7 - 18
% Passing	100	81%*	68%*	49%*	19%*	10%*	2%*

USDA Textural (based on 100% < #10 sieve) Topsoil Classification = Sand, did not met "Sandy Loam" requirement
Observations: Sample was free of sticks, roots, and/or stones exceeding 2" (State max. allowable).

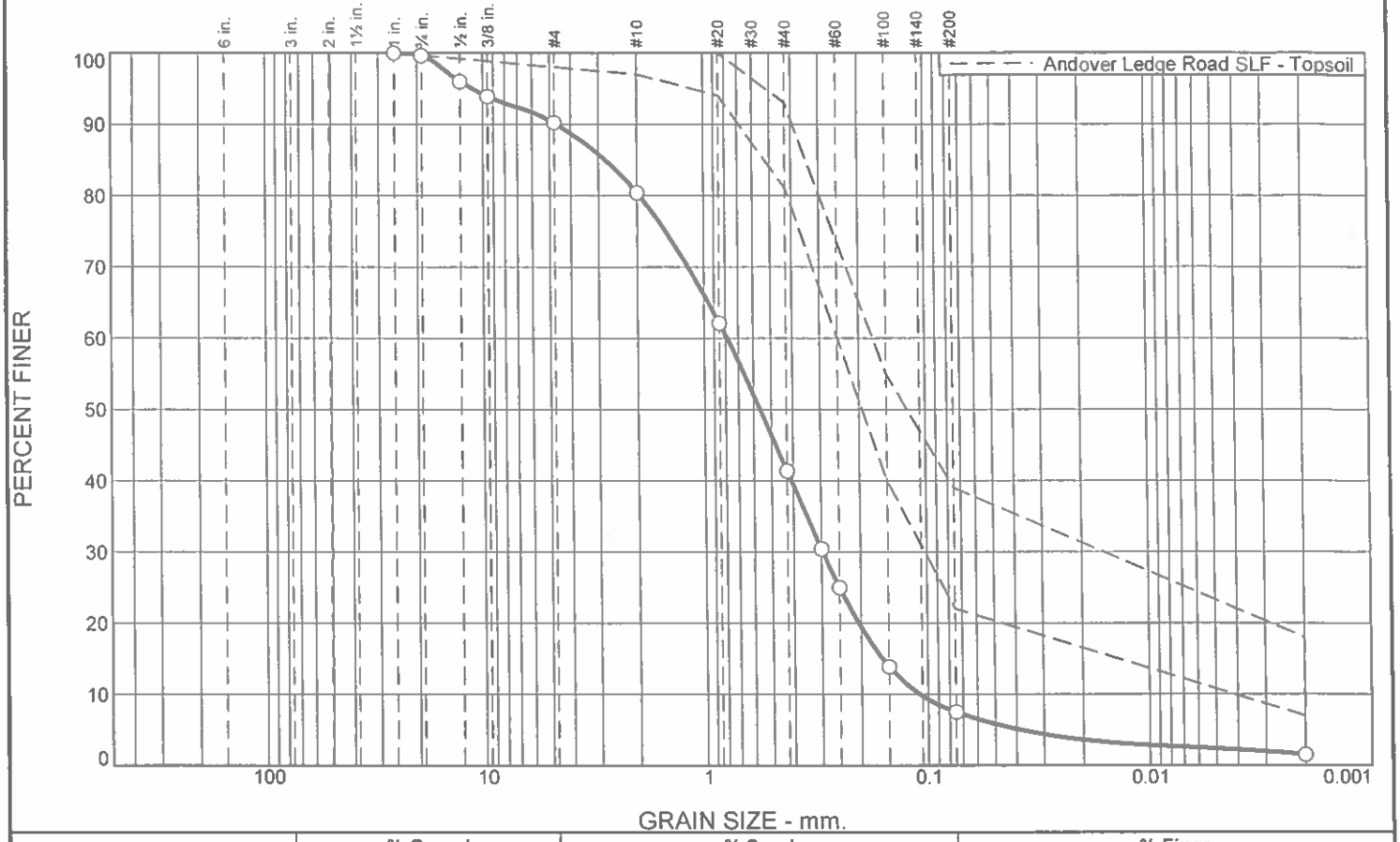
We believe that you will find this information, and the attached gradation curve, helpful in evaluating the material. Should you have any questions, or require further testing assistance, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.3	9.5	9.8	39.0	33.9	6.0	1.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0	100	
3/4"	99.7		
1/2"	96.0		
3/8"	93.9		
#4	90.2		
#10	80.4	97-100	X
#20	62.1	94-100	X
#40	41.4	81-93	X
#50	30.4		
#60	25.0		
#100	13.9	40-55	X
#200	7.5	22-39	X
0.002mm	1.5	7-18	X

* Andover Ledge Road SLF - Topsoil

Material Description

Brown m/f sand/organics trace gravel trace silt
USDA Textural Classification = Sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 2.7790 D_{60}= 0.7849 D_{50}= 0.5603
D_{30}= 0.2961 D_{15}= 0.1608 D_{10}= 0.1093
C_u= 7.18 C_c= 1.02

Classification

USCS= SW-SM AASHTO= A-1-b

Remarks

Sample submitted by client on 10/29/24
Did not meet Andover SLF Topsoil gradation limits
See letter dated 11/04/24 for additional information

Sample No.: L-35517 **Source of Sample:** Andover SLF **Date:** 11/4/24
Location: Loam **Elev./Depth:** 17.000 cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

November 4, 2024

Mr. John Bates
J. Bates & Son LLC
57 Lawrence Street
Clinton, MA 01510

RE: Topsoil Laboratory Test Results
Andover SLF – Topsoil, 17000cy sample
Andover, Massachusetts **Project # 26023**

Dear Mr. Bates,

We submit herein the results of pH, organic content, macro-nutrient, and gradation (#200 sieve) analyses completed on topsoil sample **L-35517**, submitted October 29, 2024 and stated to represent above source. The gradation and organic tests were completed per ASTM D-422 & D-2974, while the nutrient tests were in accordance with the standard LaMotte procedures. The lab results and conclusions ("Topsoil" job's limits listed) are summarized below:

pH = 6.8, neutral, met the job's "topsoil" limits of 5.5 to 7.0
Organic Content = 8.3 %, good, met the 8% to 10% "topsoil" job's limits
Nitrogen, N = 50 lb./acre fair, little additional nitrogen suggested
Phosphorus, P = 200 lb./acre good, minimal additional phosphorus suggested
Potash, K = 120 lb./acre low, some additional potassium suggested

USDA Sizing	Gravel (>#10)	Sand (#10 to .05)	Silt (<.05 to >002)	Clay (<.002)
Total Gradation:	20	75	4	1
Sand Fraction:	0	94	5	1

"Topsoil" job limits gradation specifications:

Sieve	1" (50 mm)	#10 (2.00 mm)	#20 (850µm)	#40 (425µm)	#100 (150 µm)	#200 (75 µm)	0.002mm (2 µm)
Spec Range	100	97 - 100	94 - 100	81 - 93	40 - 55	22 - 39	7 - 18
% Passing	100	80%*	62%*	41%*	14%*	8%*	2%*

USDA Textural (based on 100% < #10 sieve) Topsoil Classification = Sand, did not met "Sandy Loam" requirement
Observations: Sample was free of sticks, roots, and/or stones exceeding 2" (State max. allowable).

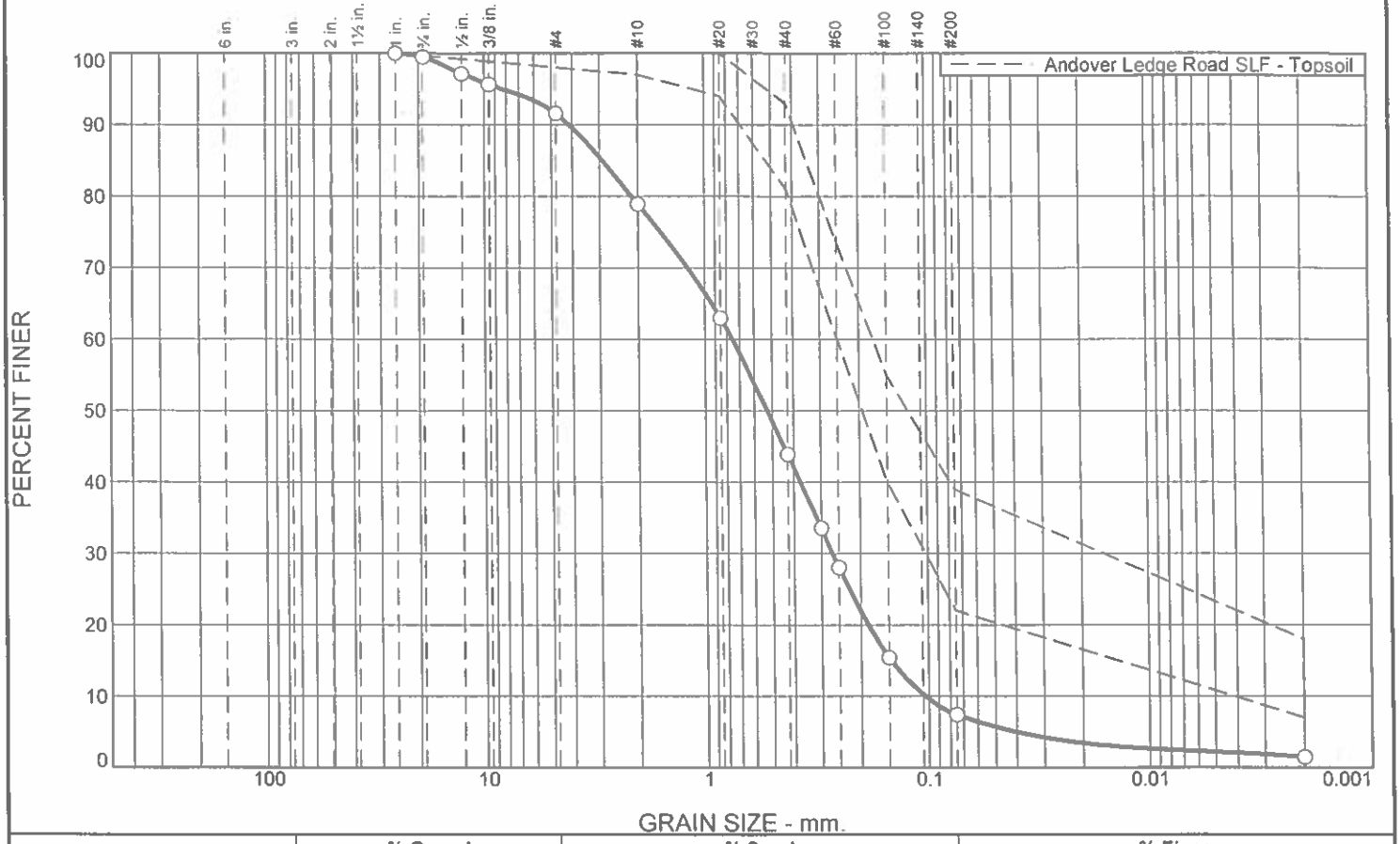
We believe that you will find this information, and the attached gradation curve, helpful in evaluating the material. Should you have any questions, or require further testing assistance, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.5	7.9	12.7	35.0	36.5	6.0	1.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0	100	
3/4"	99.5		
1/2"	97.1		
3/8"	95.6		
#4	91.6		
#10	78.9	97-100	X
#20	63.0	94-100	X
#40	43.9	81-93	X
#50	33.6		
#60	28.0		
#100	15.4	40-55	X
#200	7.4	22-39	X
0.002mm	1.4	7-18	X

* Andover Ledge Road SLF - Topsoil

Material Description

Brown sand/organics trace gravel trace silt
USDA Textural Classification = Sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 2.8997 D_{60}= 0.7526 D_{50}= 0.5249
D_{30}= 0.2674 D_{15}= 0.1468 D_{10}= 0.1038
C_u= 7.25 C_c= 0.92

Classification

USCS= SP-SM AASHTO= A-1-b

Remarks

Sample submitted by client on 10/29/24
Did not meet Andover SLF Topsoil gradation limits
See letter dated 11/05/24 for additional information

Sample No.: L-35518 **Source of Sample:** Andover SLF **Date:** 11/5/24
Location: Loam **Elev./Depth:** 18.000 cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

November 5, 2024

Mr. John Bates
J. Bates & Son LLC
57 Lawrence Street
Clinton, MA 01510

RE: Topsoil Laboratory Test Results
Andover SLF – Topsoil, 18000cy sample
Andover, Massachusetts **Project # 26023**

Dear Mr. Bates,

We submit herein the results of pH, organic content, macro-nutrient, and gradation (#200 sieve) analyses completed on topsoil sample **L-35518**, submitted October 29, 2024 and stated to represent above source. The gradation and organic tests were completed per ASTM D-422 & D-2974, while the nutrient tests were in accordance with the standard LaMotte procedures. The lab results and conclusions ("Topsoil" job's limits listed) are summarized below:

pH = 6.2, neutral, met the job's "topsoil" limits of 5.5 to 7.0
Organic Content = 8.2 %, good, met the 8% to 10% "topsoil" job's limits
Nitrogen, N = 50 lb./acre fair, little additional nitrogen suggested
Phosphorus, P = 150 lb./acre good, minimal additional phosphorus suggested
Potash, K = 120 lb./acre low, some additional potassium suggested

USDA Sizing	Gravel (>#10)	Sand (#10 to .05)	Silt (<.05 to >002)	Clay (<.002)
Total Gradation:	21	74	4	1
Sand Fraction:	0	94	5	1

"Topsoil" job limits gradation specifications:

Sieve	1" (50 mm)	#10 (2.00 mm)	#20 (850µm)	#40 (425µm)	#100 (150 µm)	#200 (75 µm)	0.002mm (2 µm)
Spec Range	100	97 - 100	94 - 100	81 - 93	40 - 55	22 - 39	7 - 18
% Passing	100	79%*	63%*	44%*	15%*	7%*	1%*

USDA Textural (based on 100% < #10 sieve) Topsoil Classification = Sand, did not met "Sandy Loam" requirement
Observations: Sample was free of sticks, roots, and/or stones exceeding 2" (State max. allowable).

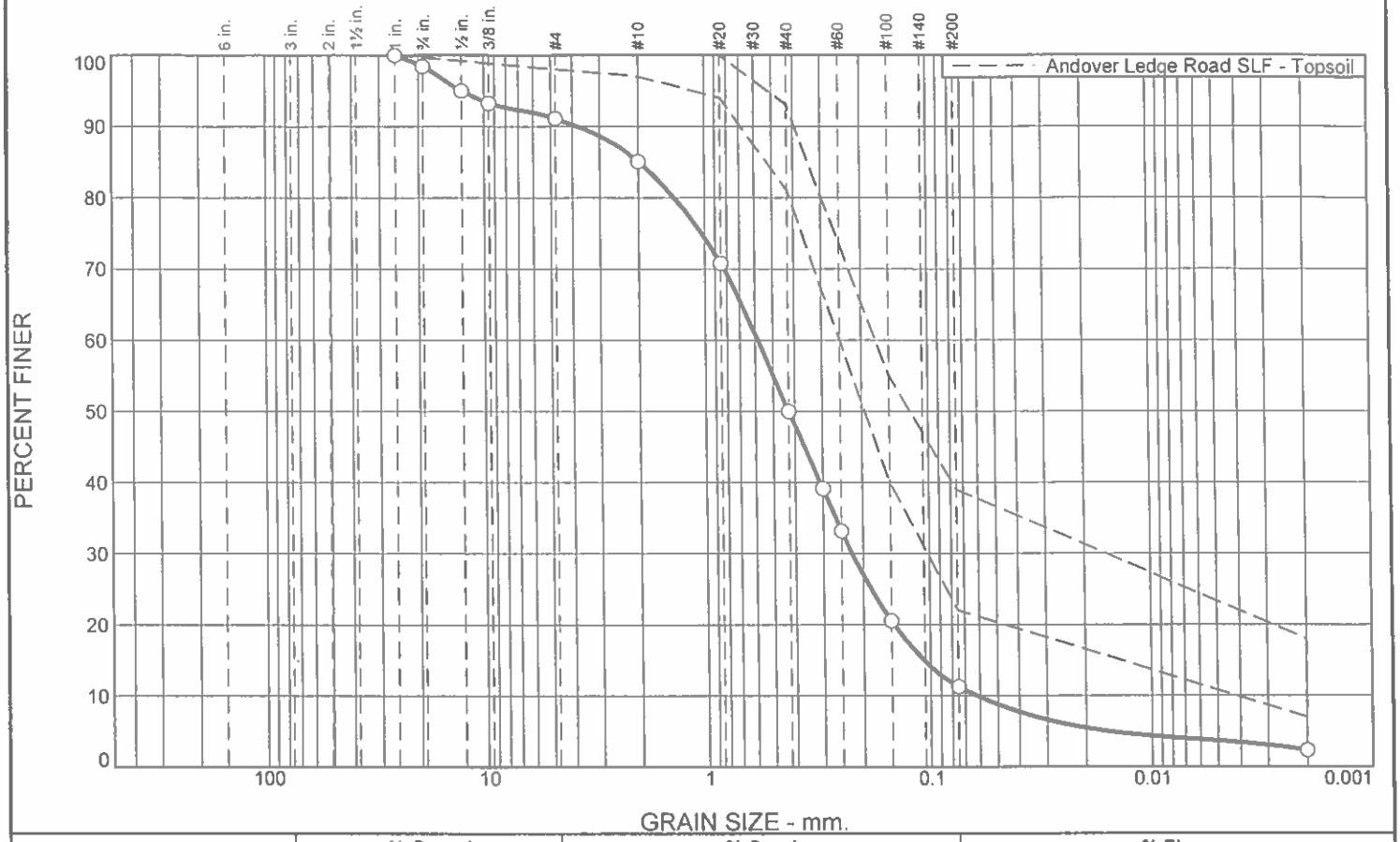
We believe that you will find this information, and the attached gradation curve, helpful in evaluating the material. Should you have any questions, or require further testing assistance, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	1.6	7.3	6.0	35.1	38.7	9.0	2.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0	100	
3/4"	98.4		
1/2"	95.0		
3/8"	93.3		
#4	91.1		
#10	85.1	97-100	X
#20	70.8	94-100	X
#40	50.0	81-93	X
#50	39.1		
#60	33.2		
#100	20.5	40-55	X
#200	11.3	22-39	X
0.002mm	2.3	7-18	X

* Andover Ledge Road SLF - Topsoil

Material Description

Brown sand/organics little silt trace gravel
USDA Textural Classification = Sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 1.9887 D_{60}= 0.5823 D_{50}= 0.4252
D_{30}= 0.2234 D_{15}= 0.1072 D_{10}= 0.0620
C_u= 9.39 C_c= 1.38

Classification

USCS= SW-SM AASHTO= A-1-b

Remarks

Sample submitted by client on 10/29/24
Did not meet Andover SLF Topsoil gradation limits
See letter dated 11/05/24 for additional information

Sample No.: L-35519 **Source of Sample:** Andover SLF **Date:** 11/5/24
Location: Loam **Elev./Depth:** 19.000 cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

November 5, 2024

Mr. John Bates
J. Bates & Son LLC
57 Lawrence Street
Clinton, MA 01510

RE: Topsoil Laboratory Test Results
Andover SLF – Topsoil, 19000cy sample
Andover, Massachusetts **Project # 26023**

Dear Mr. Bates,

We submit herein the results of pH, organic content, macro-nutrient, and gradation (#200 sieve) analyses completed on topsoil sample **L-35519**, submitted October 29, 2024 and stated to represent above source. The gradation and organic tests were completed per ASTM D-422 & D-2974, while the nutrient tests were in accordance with the standard LaMotte procedures. The lab results and conclusions ("Topsoil" job's limits listed) are summarized below:

pH = 6.6, neutral, met the job's "topsoil" limits of 5.5 to 7.0
Organic Content = 8.1 %, good, met the 8% to 10% "topsoil" job's limits
Nitrogen, N = 60 lb./acre fair, little additional nitrogen suggested
Phosphorus, P = 200 lb./acre good, minimal additional phosphorus suggested
Potash, K = 100 lb./acre low, some additional potassium suggested

USDA Sizing	Gravel (>#10)	Sand (#10 to .05)	Silt (<.05 to >002)	Clay (<.002)
Total Gradation:	15	77	6	2
Sand Fraction:	0	91	7	2

"Topsoil" job limits gradation specifications:

Sieve	1" (50 mm)	#10 (2.00 mm)	#20 (850µm)	#40 (425µm)	#100 (150 µm)	#200 (75 µm)	0.002mm (2 µm)
Spec Range	100	97 - 100	94 - 100	81 - 93	40 - 55	22 - 39	7 - 18
% Passing	100	85%*	71%*	50%*	21%*	11%*	2%*

USDA Textural (based on 100% < #10 sieve) Topsoil Classification = Sand, did not met "Sandy Loam" requirement
Observations: Sample was free of sticks, roots, and/or stones exceeding 2" (State max. allowable).

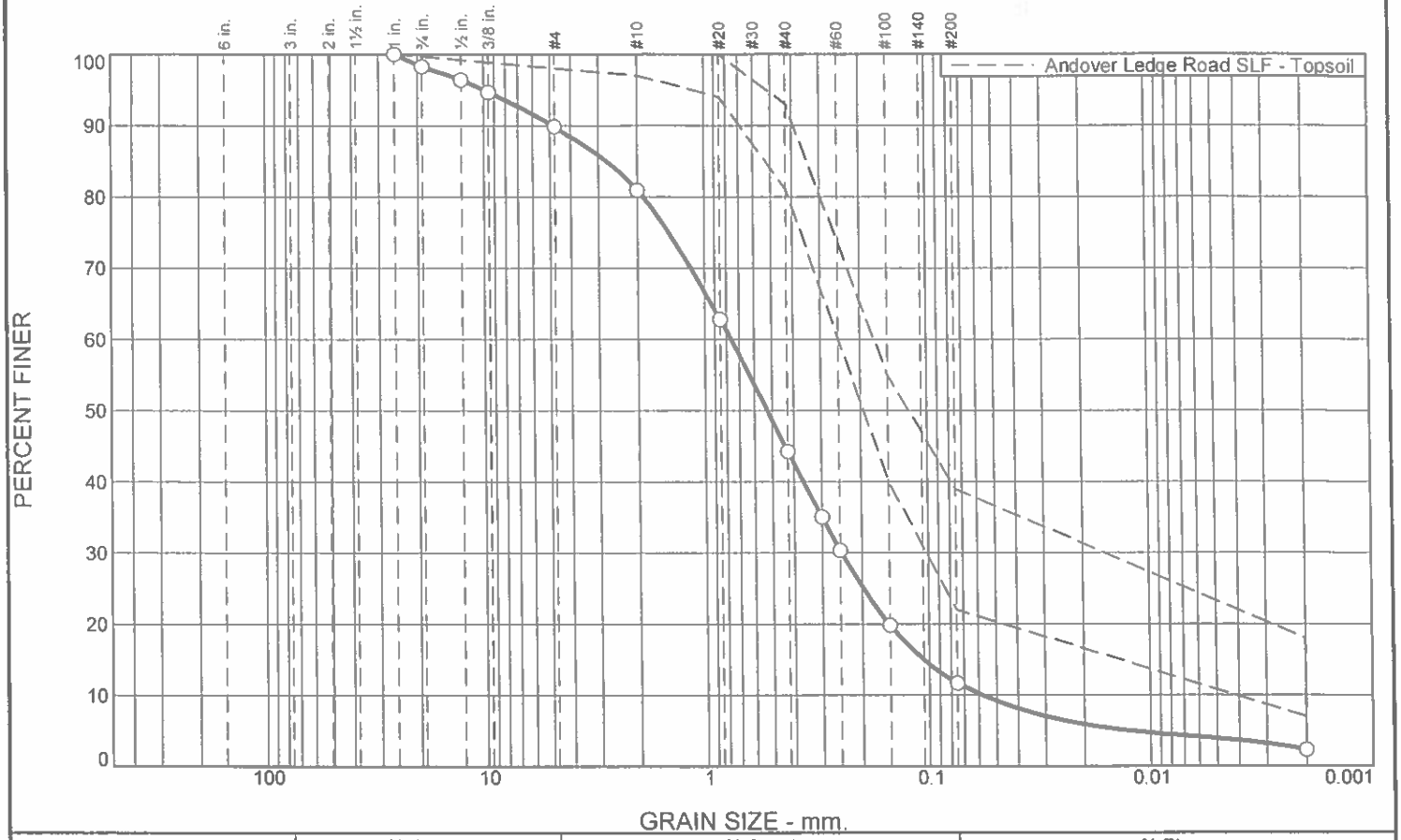
We believe that you will find this information, and the attached gradation curve, helpful in evaluating the material. Should you have any questions, or require further testing assistance, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	1.7	8.5	8.9	36.7	32.5	9.4	2.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1"	100.0	100	
3/4"	98.3		
1/2"	96.4		
3/8"	94.7		
#4	89.8		
#10	80.9	97-100	X
#20	62.8	94-100	X
#40	44.2	81-93	X
#50	35.1		
#60	30.4		
#100	19.8	40-55	X
#200	11.7	22-39	X
0.002mm	2.3	7-18	X

* Andover Ledge Road SLF - Topsoil

Material Description

Brown m/f sand/organics little silt little gravel
USDA Textural Classification = Sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 2.7436 D_{60}= 0.7595 D_{50}= 0.5250
D_{30}= 0.2461 D_{15}= 0.1062 D_{10}= 0.0576
C_u= 13.19 C_c= 1.39

Classification

USCS= SW-SM AASHTO= A-1-b

Remarks

Sample submitted by client on 10/29/24
Did not meet Andover SLF Topsoil grdadation limits
See letter dated 11/05/24 for additional information

Sample No.: L-35520 **Source of Sample:** Andover SLF **Date:** 11/5/24
Location: Loam **Elev./Depth:** 20.000 cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

November 5, 2024

Mr. John Bates
J. Bates & Son LLC
57 Lawrence Street
Clinton, MA 01510

RE: Topsoil Laboratory Test Results
Andover SLF – Topsoil, 20000cy sample
Andover, Massachusetts **Project # 26023**

Dear Mr. Bates,

We submit herein the results of pH, organic content, macro-nutrient, and gradation (#200 sieve) analyses completed on topsoil sample **L-35520**, submitted October 29, 2024 and stated to represent above source. The gradation and organic tests were completed per ASTM D-422 & D-2974, while the nutrient tests were in accordance with the standard LaMotte procedures. The lab results and conclusions ("Topsoil" job's limits listed) are summarized below:

pH = 6.3, neutral, met the job's "topsoil" limits of 5.5 to 7.0
Organic Content = 8.1 %, good, met the 8% to 10% "topsoil" job's limits
Nitrogen, N = 40 lb./acre fair, little additional nitrogen suggested
Phosphorus, P = 150 lb./acre good, minimal additional phosphorus suggested
Potash, K = 100 lb./acre low, some additional potassium suggested

USDA Sizing	Gravel (>#10)	Sand (#10 to .05)	Silt (<.05 to >002)	Clay (<.002)
Total Gradation:	19	72	7	2
Sand Fraction:	0	89	9	2

"Topsoil" job limits gradation specifications:

Sieve	1" (50 mm)	#10 (2.00 mm)	#20 (850µm)	#40 (425µm)	#100 (150 µm)	#200 (75 µm)	0.002mm (2 µm)
Spec Range	100	97 - 100	94 - 100	81 - 93	40 - 55	22 - 39	7 - 18
% Passing	100	81%*	63%*	44%*	20%*	12%*	2%*

USDA Textural (based on 100% < #10 sieve) Topsoil Classification = Sand, did not met "Sandy Loam" requirement
Observations: Sample was free of sticks, roots, and/or stones exceeding 2" (State max. allowable).

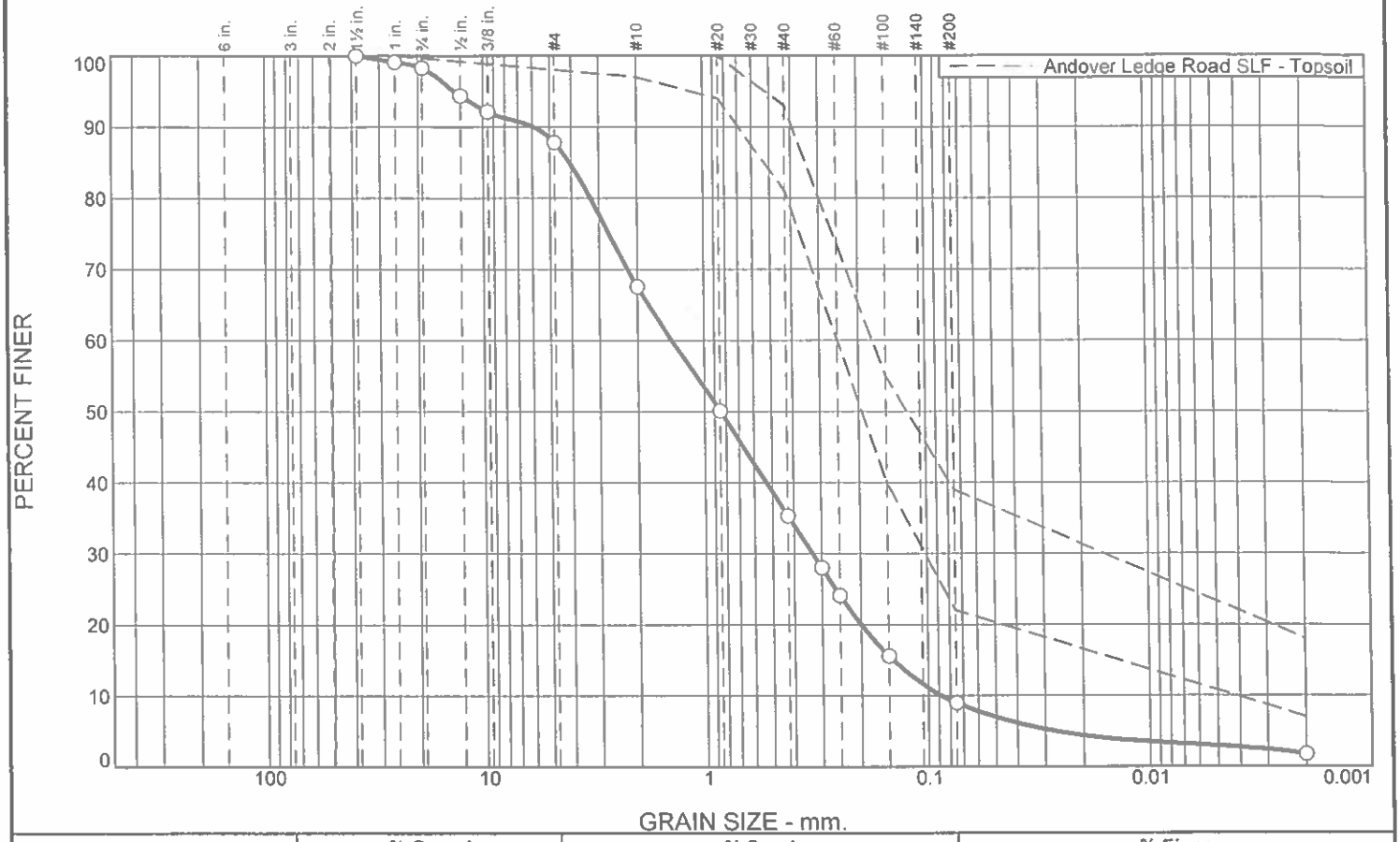
We believe that you will find this information, and the attached gradation curve, helpful in evaluating the material. Should you have any questions, or require further testing assistance, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	1.7	10.5	20.2	32.3	26.4	7.1	1.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5"	100.0		
1"	99.1	100	X
3/4"	98.3		
1/2"	94.4		
3/8"	92.1		
#4	87.8		
#10	67.6	97-100	X
#20	50.1	94-100	X
#40	35.3	81-93	X
#50	28.0		
#60	24.1		
#100	15.6	40-55	X
#200	8.9	22-39	X
0.002mm	1.8	7-18	X

* Andover Ledge Road SLF - Topsoil

Material Description

Brown m/f sand/organics little gravel trace silt
USDA Textural Classification = Sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 4.0571 D_{60}= 1.3900 D_{50}= 0.8458
D_{30}= 0.3298 D_{15}= 0.1434 D_{10}= 0.0880
C_u= 15.80 C_c= 0.89

Classification

USCS= SP-SM AASHTO= A-1-b

Remarks

Sample submitted by client on 10/29/24
Did not meet Andover SLF Topsoil gradation limits
See letter dated 11/05/24 for additional information

Sample No.: L-35521 **Source of Sample:** Andover SLF **Date:** 11/5/24
Location: Loam **Elev./Depth:** 21.000 cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

November 5, 2024

Mr. John Bates
J. Bates & Son LLC
57 Lawrence Street
Clinton, MA 01510

RE: Topsoil Laboratory Test Results
Andover SLF – Topsoil, 21000cy sample
Andover, Massachusetts **Project # 26023**

Dear Mr. Bates,

We submit herein the results of pH, organic content, macro-nutrient, and gradation (#200 sieve) analyses completed on topsoil sample **L-35521**, submitted October 29, 2024 and stated to represent above source. The gradation and organic tests were completed per ASTM D-422 & D-2974, while the nutrient tests were in accordance with the standard LaMotte procedures. The lab results and conclusions ("Topsoil" job's limits listed) are summarized below:

pH = 6.4, neutral, met the job's "topsoil" limits of 5.5 to 7.0
Organic Content = 8.2 %, good, met the 8% to 10% "topsoil" job's limits
Nitrogen, N = 60 lb./acre fair, little additional nitrogen suggested
Phosphorus, P = 200 lb./acre good, minimal additional phosphorus suggested
Potash, K = 140 lb./acre low, some additional potassium suggested

USDA Sizing	Gravel (>#10)	Sand (#10 to .05)	Silt (<.05 to >002)	Clay (<.002)
Total Gradation:	32	60	6	2
Sand Fraction:	0	90	7	3

"Topsoil" job limits gradation specifications:

Sieve	1" (50 mm)	#10 (2.00 mm)	#20 (850µm)	#40 (425µm)	#100 (150 µm)	#200 (75 µm)	0.002mm (2 µm)
Spec Range	100	97 - 100	94 - 100	81 - 93	40 - 55	22 - 39	7 - 18
% Passing	100	68%*	50%*	35%*	16%*	9%*	2%*

USDA Textural (based on 100% < #10 sieve) Topsoil Classification = Sand, did not met "Sandy Loam" requirement
Observations: Sample was free of sticks, roots, and/or stones exceeding 2" (State max. allowable).

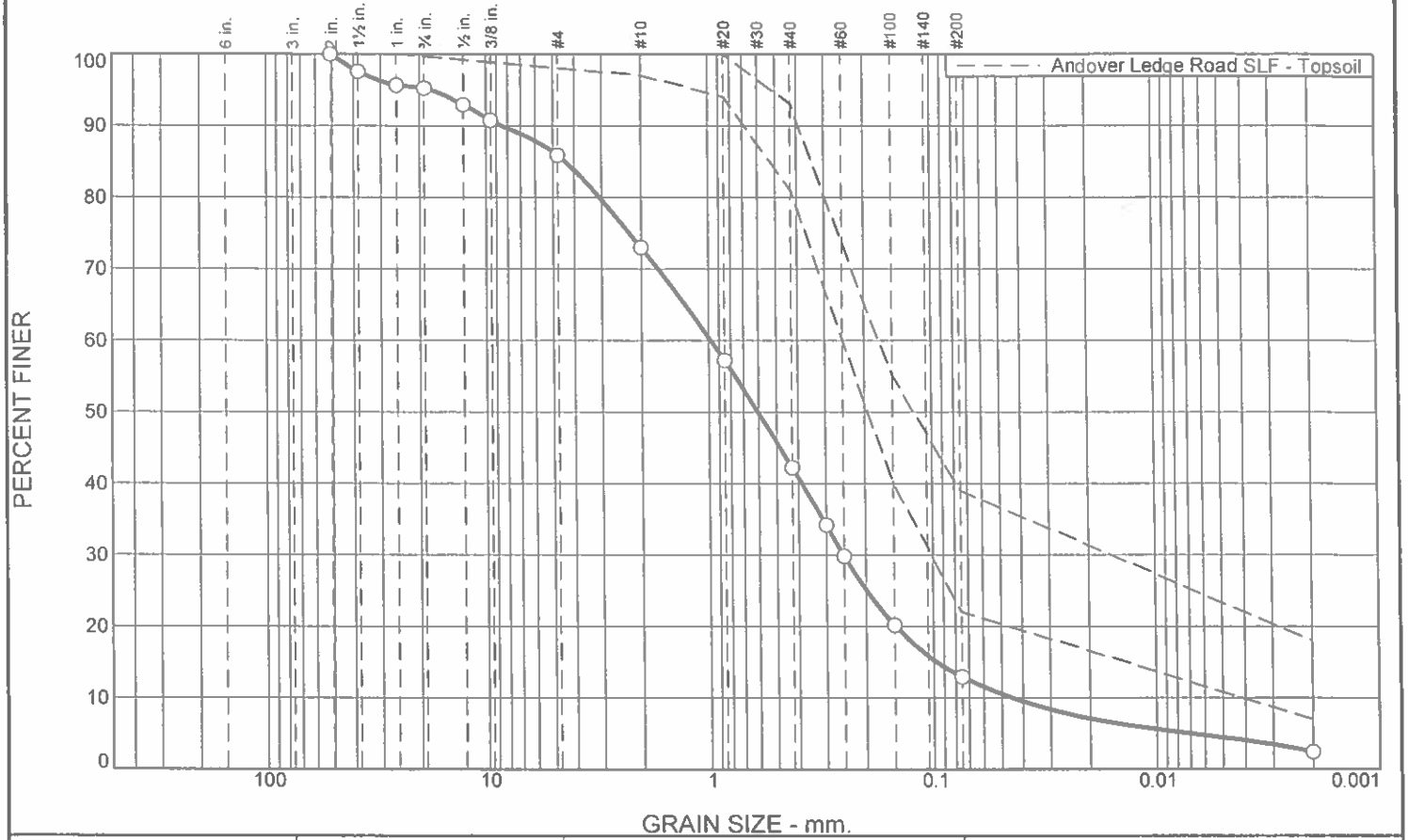
We believe that you will find this information, and the attached gradation curve, helpful in evaluating the material. Should you have any questions, or require further testing assistance, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	4.8	9.3	12.9	30.8	29.3	10.5	2.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2"	100.0		
1.5"	97.6		
1"	95.6	100	X
3/4"	95.2		
1/2"	92.9		
3/8"	90.8		
#4	85.9		
#10	73.0	97-100	X
#20	57.2	94-100	X
#40	42.2	81-93	X
#50	34.2		
#60	29.8		
#100	20.2	40-55	X
#200	12.9	22-39	X
0.002mm	2.4	7-18	X

* Andover Ledge Road SLF - Topsoil

Material Description

Brown silty sand/organics little gravel
USDA Textural Classification = Loamy Sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 4.4063 D_{60}= 0.9798 D_{50}= 0.6042
D_{30}= 0.2521 D_{15}= 0.0973 D_{10}= 0.0448
C_u= 21.88 C_c= 1.45

Classification

USCS= SM AASHTO= A-1-b

Remarks

Sample submitted by client on 10/29/24
Did not meet Andover SLF Topsoil gradation limits
See letter dated 11/05/24 for additional information

Sample No.: L-35522 **Source of Sample:** Andover SLF **Date:** 11/5/24
Location: Loam **Elev./Depth:** 22.000 cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

November 5, 2024

Mr. John Bates
J. Bates & Son LLC
57 Lawrence Street
Clinton, MA 01510

RE: Topsoil Laboratory Test Results
Andover SLF – Topsoil, 22000cy sample
Andover, Massachusetts **Project # 26023**

Dear Mr. Bates,

We submit herein the results of pH, organic content, macro-nutrient, and gradation (#200 sieve) analyses completed on topsoil sample **L-35522**, submitted October 29, 2024 and stated to represent above source. The gradation and organic tests were completed per ASTM D-422 & D-2974, while the nutrient tests were in accordance with the standard LaMotte procedures. The lab results and conclusions ("Topsoil" job's limits listed) are summarized below:

pH = 6.2, neutral, met the job's "topsoil" limits of 5.5 to 7.0
Organic Content = 8.1%, good, met the 8% to 10% "topsoil" job's limits
Nitrogen, N = 60 lb./acre fair, little additional nitrogen suggested
Phosphorus, P = 200 lb./acre good, minimal additional phosphorus suggested
Potash, K = 100 lb./acre low, some additional potassium suggested

USDA Sizing	Gravel (>#10)	Sand (#10 to .05)	Silt (<.05 to >002)	Clay (<.002)
Total Gradation:	27	62	9	2
Sand Fraction:	0	85	12	3

"Topsoil" job limits gradation specifications:

Sieve	1" (50 mm)	#10 (2.00 mm)	#20 (850µm)	#40 (425µm)	#100 (150 µm)	#200 (75 µm)	0.002mm (2 µm)
Spec Range	100	97 - 100	94 - 100	81 - 93	40 - 55	22 - 39	7 - 18
% Passing	100	73%*	57%*	42%*	20%*	13%*	2%*

USDA Textural (based on 100% < #10 sieve) Topsoil Classification = Loamy Sand, did not met "Sandy Loam" requirement
Observations: Sample was free of sticks, roots, and/or stones exceeding 2" (State max. allowable).

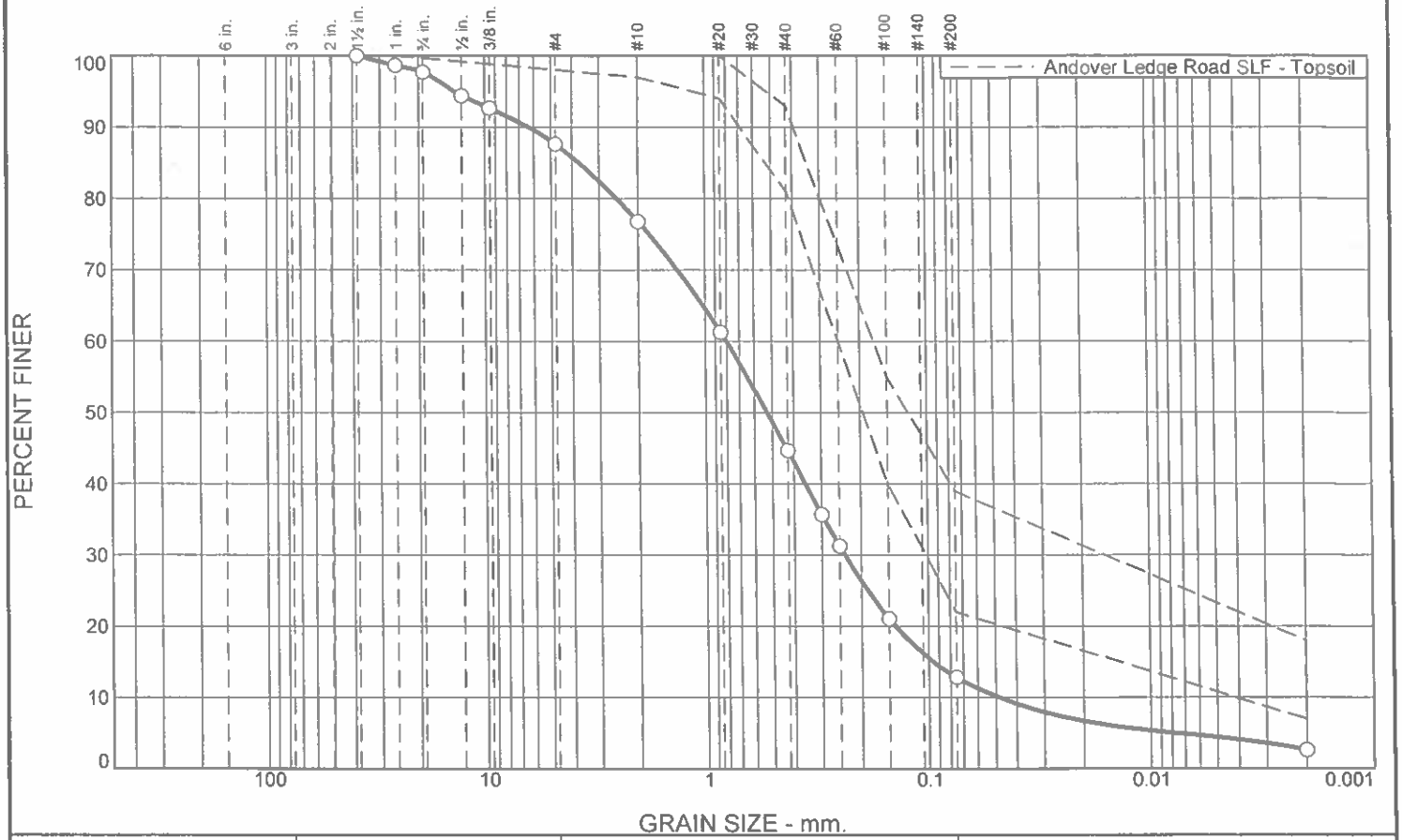
We believe that you will find this information, and the attached gradation curve, helpful in evaluating the material. Should you have any questions, or require further testing assistance, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	2.3	10.1	10.8	32.1	31.9	10.2	2.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5"	100.0		
1"	98.7	100	X
3/4"	97.7		
1/2"	94.4		
3/8"	92.7		
#4	87.6		
#10	76.8	97-100	X
#20	61.3	94-100	X
#40	44.7	81-93	X
#50	35.7		
#60	31.3		
#100	21.1	40-55	X
#200	12.8	22-39	X
0.002mm	2.6	7-18	X

* Andover Ledge Road SLF - Topsoil

Material Description

Brown silty sand/organics little gravel
USDA Textural Classification = Loamy Sand

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 3.7129 D_{60}= 0.8013 D_{50}= 0.5261
D_{30}= 0.2361 D_{15}= 0.0955 D_{10}= 0.0480
C_u= 16.70 C_c= 1.45

Classification

USCS= SM AASHTO= A-1-b

Remarks

Sample submitted by client on 10/29/24
Did not meet Andover SLF Topsoil gradation limits
See letter dated 11/05/24 for additional information

Sample No.: L-35523 **Source of Sample:** Andover SLF **Date:** 11/5/24
Location: Loam **Elev./Depth:** 23.000 cy

YANKEE ENGINEERING & TESTING, INC.

Client: J. Bates & Son LLC
Project: J. Bates & Son LLC
Various Sites/Projects
Project No: 26023

Tested By: AK **Checked By:** SMM

Yankee Engineering & Testing, Inc.

November 5, 2024

Mr. John Bates
J. Bates & Son LLC
57 Lawrence Street
Clinton, MA 01510

RE: Topsoil Laboratory Test Results
Andover SLF – Topsoil, 23000cy sample
Andover, Massachusetts **Project # 26023**

Dear Mr. Bates,

We submit herein the results of pH, organic content, macro-nutrient, and gradation (#200 sieve) analyses completed on topsoil sample **L-35523**, submitted October 29, 2024 and stated to represent above source. The gradation and organic tests were completed per ASTM D-422 & D-2974, while the nutrient tests were in accordance with the standard LaMotte procedures. The lab results and conclusions ("Topsoil" job's limits listed) are summarized below:

pH = 6.2, neutral, met the job's "topsoil" limits of 5.5 to 7.0
Organic Content = 8.3%, good, met the 8% to 10% "topsoil" job's limits
Nitrogen, N = 40 lb./acre fair, little additional nitrogen suggested
Phosphorus, P = 150 lb./acre good, minimal additional phosphorus suggested
Potash, K = 100 lb./acre low, some additional potassium suggested

USDA Sizing	Gravel (>#10)	Sand (#10 to .05)	Silt (<.05 to >002)	Clay (<.002)
Total Gradation:	23	66	9	2
Sand Fraction:	0	86	12	2

"Topsoil" job limits gradation specifications:

Sieve	1" (50 mm)	#10 (2.00 mm)	#20 (850µm)	#40 (425µm)	#100 (150 µm)	#200 (75 µm)	0.002mm (2 µm)
Spec Range	100	97 - 100	94 - 100	81 - 93	40 - 55	22 - 39	7 - 18
% Passing	100	77%*	61%*	45%*	21%*	13%*	3%*

USDA Textural (based on 100% < #10 sieve) Topsoil Classification = Loamy Sand, did not met "Sandy Loam" requirement
Observations: Sample was free of sticks, roots, and/or stones exceeding 2" (State max. allowable).

We believe that you will find this information, and the attached gradation curve, helpful in evaluating the material. Should you have any questions, or require further testing assistance, please do not hesitate to contact me at our Worcester office.

Regards,

Scott M. Mensen, P.E., P.G.
Director of Testing Services

10 Mason Street Worcester Massachusetts 01609
Tel (508) 831-7404 Fax (508) 831-7388
CONSTRUCTION INSPECTION & MATERIALS TESTING
www.yankeeengineering.com

Appendix J Gas Vent and Vent Trench Material Test Results

Benevento Materials & Research

Aggregate Gradation Report

Date: 3/18/2024

Time: pm

Sample Description: 1 1/2" Stone -

Sampling Location: Stockpile

Source: Wilmington

SIEVE	WT. RET.	% RET.	% PASSING	M2.01.1	ASTM #4
2"				100	100
1 1/2"	0	0.0	100	95 - 100	90-100
1"	15.9	42.1	58	35 - 70	20-55
3/4"	31.6	83.6	16	0 - 25	0 - 15
1/2"	37.1	98.1	2		
3/8"	37.4	98.9	1		0 - 5
#4	37.7	99.7	0.3		
#8					
#16					
#30					
#50					
#100					
#200					
PAN					

Tested By: D Pena

Sample Wet Weight: 37.8

Sample Dry Weight: 37.8

Moisture Content: 0.0%

Weight of Water: 0

Comments:

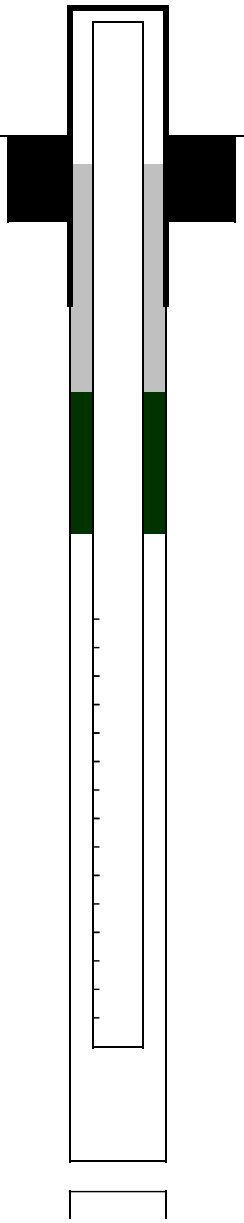
Appendix K Groundwater Monitoring Well Installation Logs

CDM Smith

75 State Street
Suite 701
Boston, MA 02109
(617) 452-6000

Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	CDM-2MR
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	11/14/2024
Project Location	Andover, MA	Ground EL:		Logged By:	E. Treble
Project Number:	289302	Riser EL:		Page:	1 of 1



GROUND SURFACE

LOCKED PROTECTIVE CASING

SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 18

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 20

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 22

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 32

BOTTOM OF BOREHOLE: 32

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

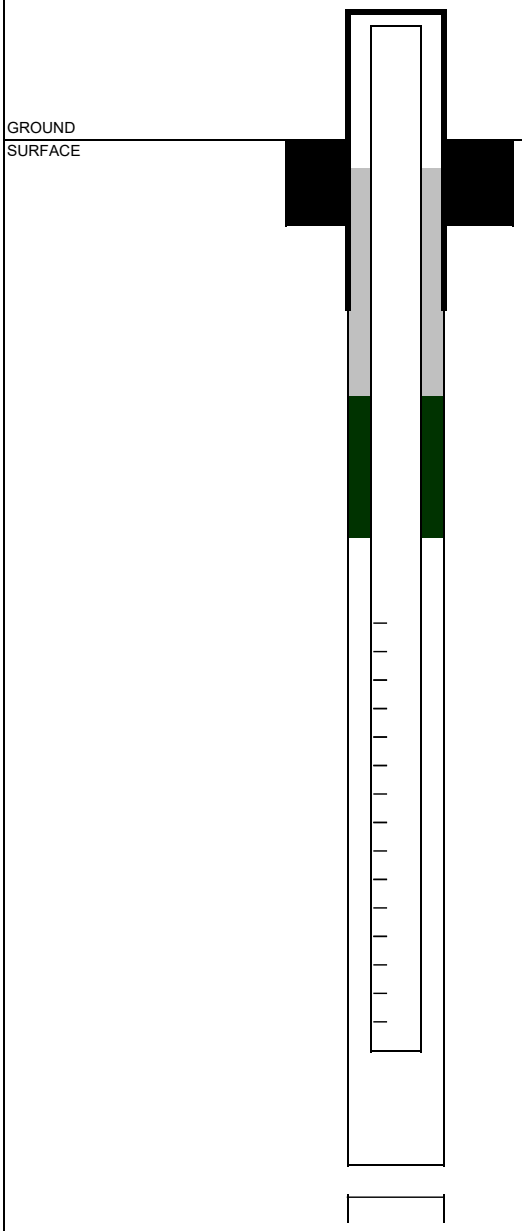
Remarks: Depth to Water: 8.89 feet
PVC Stick up at 2.97 feet

CDM Smith

75 State Street
Suite 701
Boston, MA 02109
(617) 452-6000

Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	CDM-2SR
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	11/13/2024
Project Location	Andover, MA	Ground EL:		Logged By:	K. Griffiths
Project Number:	289302	Riser EL:		Page:	1 of 1



SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 1

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 2

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 4

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 14

BOTTOM OF BOREHOLE: 14

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

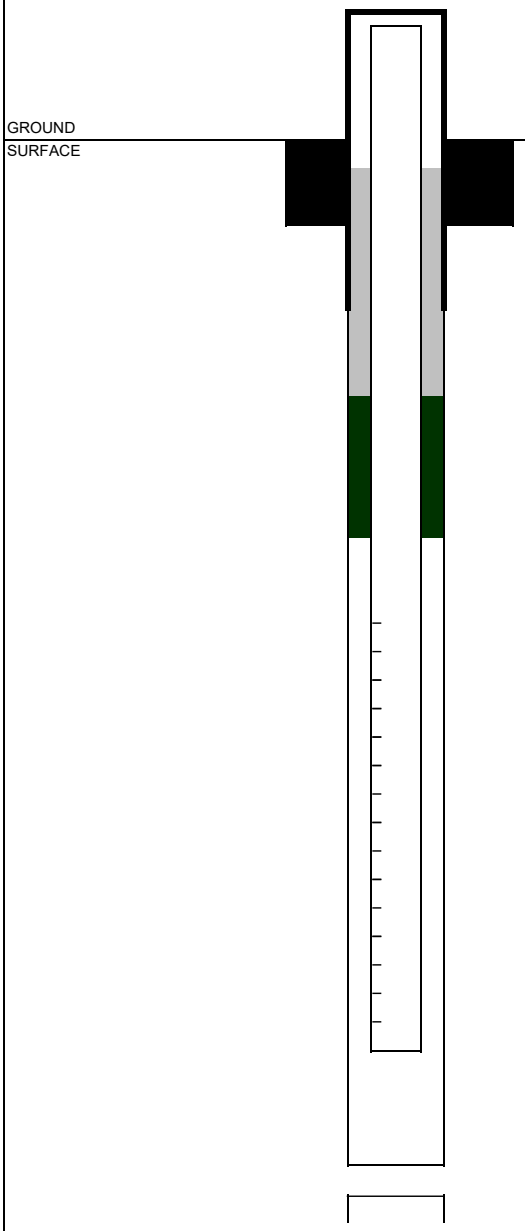
Remarks: PVC Stick up at 2.5 feet
Depth to Water: 8.07 feet

CDM Smith

75 State Street
Suite 701
Boston, MA 02109
(617) 452-6000

Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	CDM-3DR
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	11/22/2024
Project Location	Andover, MA	Ground EL:		Logged By:	K. Griffiths / E. Treble
Project Number:	289302	Riser EL:		Page:	1 of 1



SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 86

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 88

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 90

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 100

BOTTOM OF BOREHOLE: 100

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

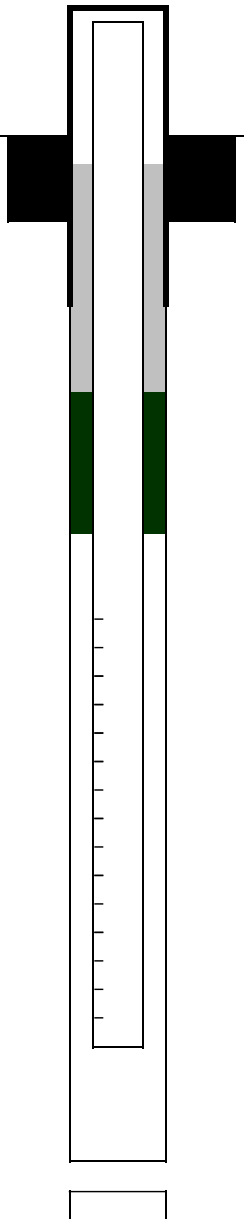
Remarks: Hit bedrock at ~ 80 fbgs. Drilled 20 feet into bedrock to install well.
PVC Stick up at 2.6 feet
Depth to Water: 97.5 feet

CDM Smith

75 State Street
Suite 701
Boston, MA 02109
(617) 452-6000

Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	CDM-3MR
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	11/11/2024
Project Location	Andover, MA	Ground EL:		Logged By:	E. Treble
Project Number:	289302	Riser EL:		Page:	1 of 1



SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 16

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 18

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 20

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 30

BOTTOM OF BOREHOLE: 43

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

Remarks: Initially planned to be the deep well, but hit refusal so converted into the medium well. The bottom of borehole was backfilled with some bentonite chips (32-43 fbgs) and then a 2 foot layer of sand underneath the screen.
Depth to Water: 6.21 fbgs
PVC Stick up at 2.92 feet

CDM Smith

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Suite 701
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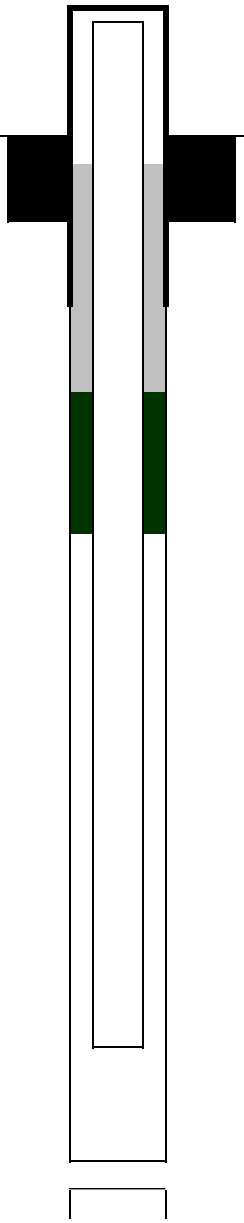
(617) 452-6000

Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	CDM-3SR
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	11/11/2024
Project Location	Andover, MA	Ground EL:		Logged By:	E. Treble
Project Number:	289302	Riser EL:		Page:	1 of 1



LOCKED PROTECTIVE CASING

SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 1

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 3

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 4

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 14

BOTTOM OF BOREHOLE: 14

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

Remarks:
PVC Stick up at 2.85 feet
Depth to Water: 9.39 feet

CDM Smith

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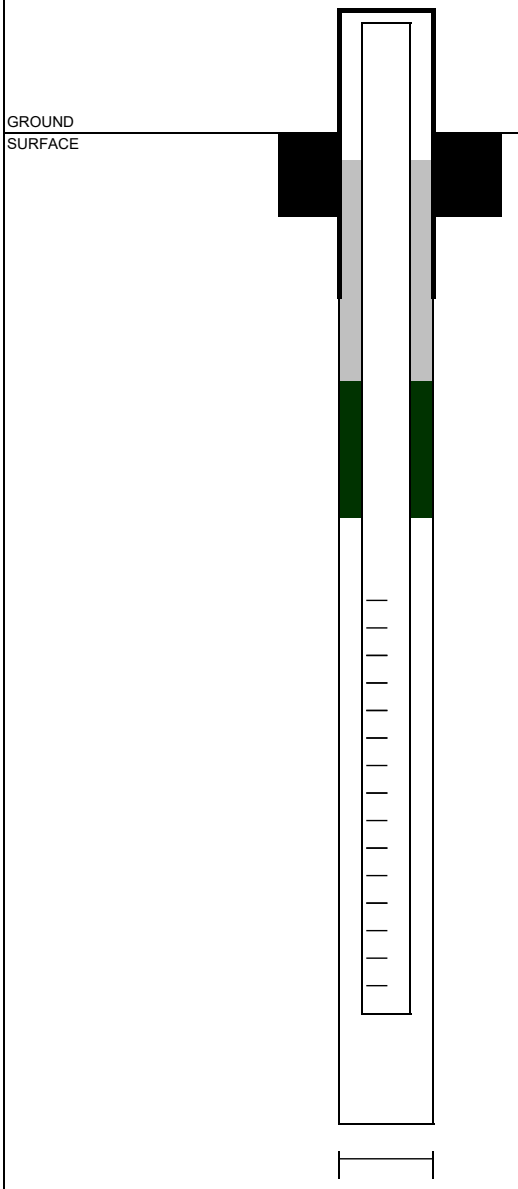
(617) 452-6000

Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	CDM-4DR
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	11/6/2024
Project Location	Andover, MA	Ground EL:		Logged By:	K. Griffiths
Project Number:	289302	Riser EL:		Page:	1 of 1



SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 46

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 48

RISER CONSTRUCTION: 2" PVC
(Type, Diameter & Material)

TOP OF SCREEN: 50

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" PVC
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 60

BOTTOM OF BOREHOLE: 60

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface, unless noted otherwise.

Remarks:

Updated On: 11/25/24

CDM Smith

75 State Street
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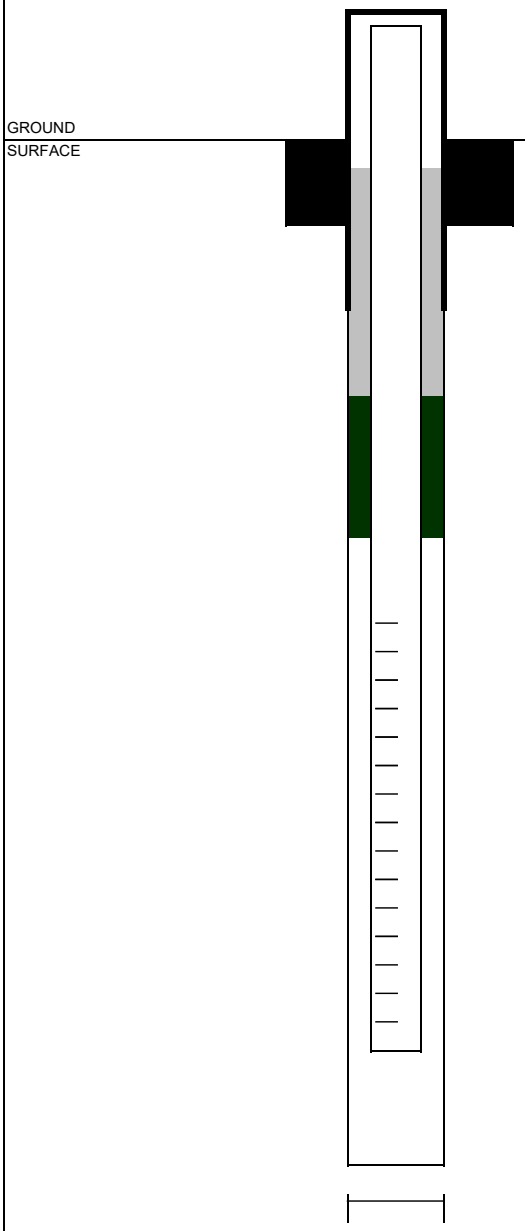
Boston, MA 02109
(617) 452-6000

Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	CDM-4SR
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	11/4/2024
Project Location	Andover, MA	Ground EL:		Logged By:	K. Griffiths
Project Number:	289302	Riser EL:		Page:	1 of 1



SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 2

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 4

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 6

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 16

BOTTOM OF BOREHOLE: 16

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

Remarks: PVC Stick up at 2.95 feet
Depth to Water: 6.80 feet

CDM Smith

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Suite 701
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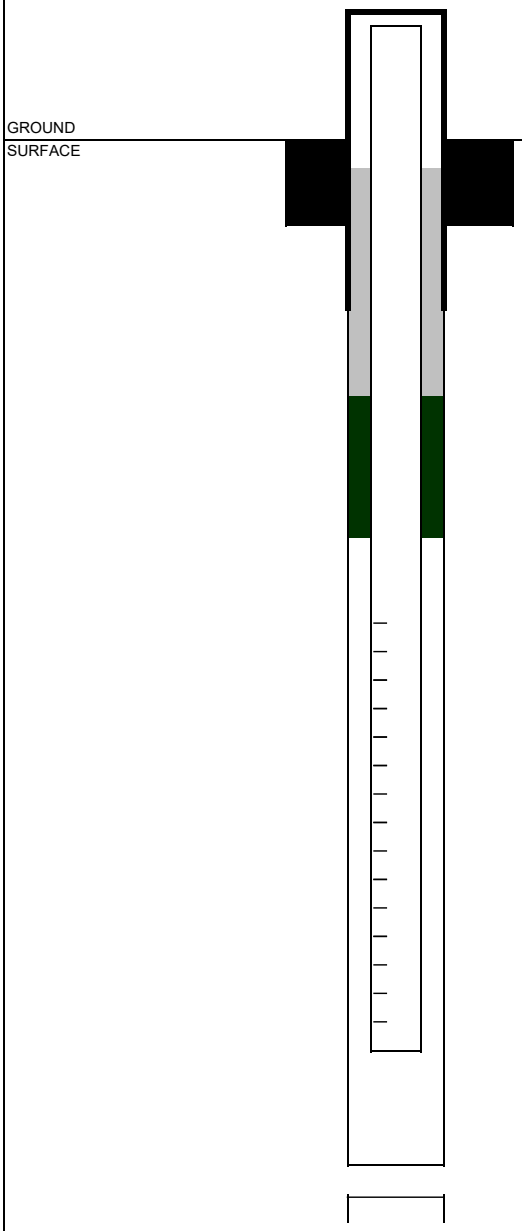
(617) 452-6000

Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	CDM-11SR
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	1/8/2025
Project Location	Andover, MA	Ground EL:		Logged By:	K. Griffiths
Project Number:	289302	Riser EL:		Page:	1 of 1



SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 3

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 4

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 5

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 15

BOTTOM OF BOREHOLE: 15

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

Remarks: PVC Stick up at 2.8 feet
Depth to Water: 11.4 fbgs

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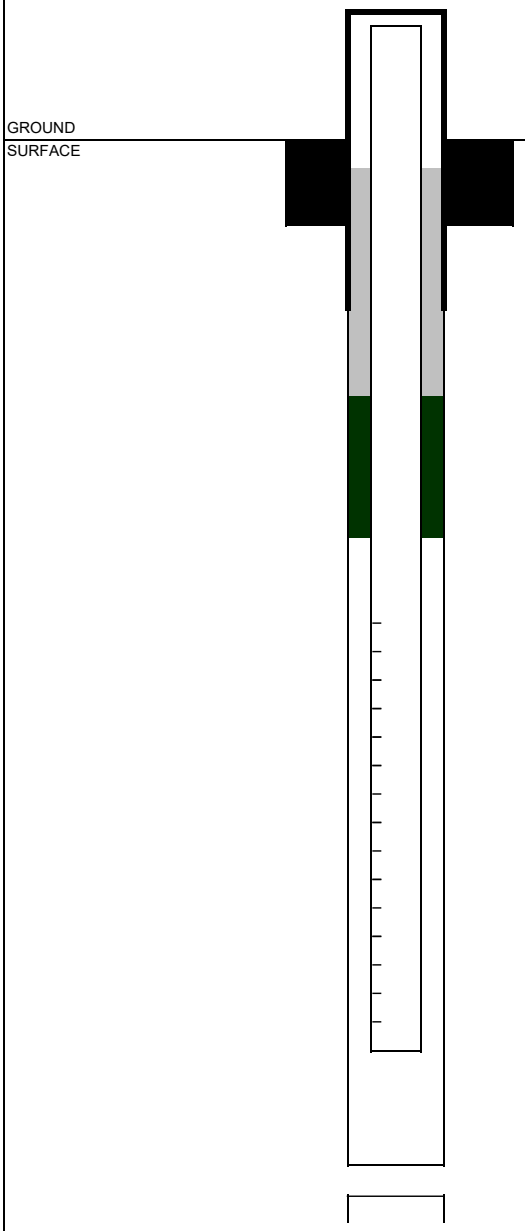
(617) 452-6000

Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	PZ-1R
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	11/15/2024
Project Location	Andover, MA	Ground EL:		Logged By:	K. Griffiths
Project Number:	289302	Riser EL:		Page:	1 of 1



SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 1

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 2

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 3

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 13

BOTTOM OF BOREHOLE: 13

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

Remarks: PVC Stick up at 2.45 feet
Depth to Water: 8.11 feet

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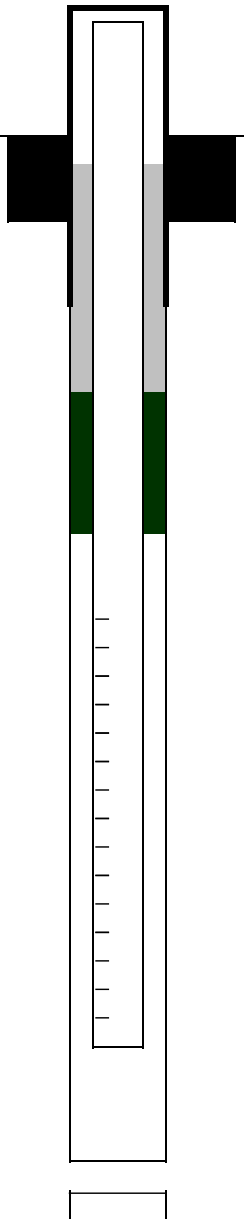
Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	CDM-16S
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	11/13/2024
Project Location	Andover, MA	Ground EL:		Logged By:	K. Griffiths
Project Number:	289302	Riser EL:		Page:	1 of 1



LOCKED PROTECTIVE CASING

SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 1

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 2

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 4

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 14

BOTTOM OF BOREHOLE: 14

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

Remarks: PVC Stick up at 2.8 feet
Depth to Water: 8.5 feet

CDM Smith

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Suite 701
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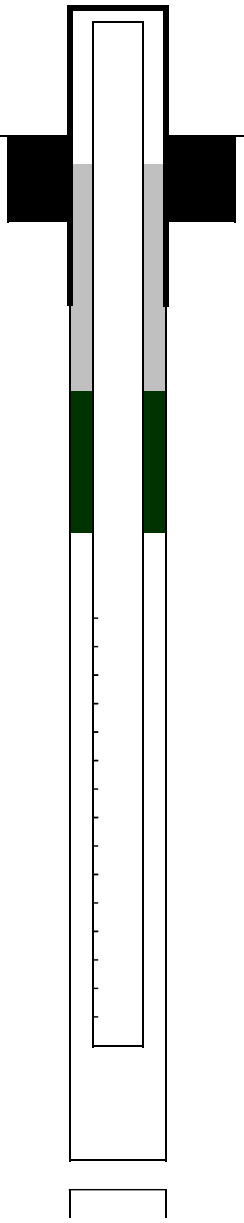
(617) 452-6000

Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	CDM-17S
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	11/12/2024
Project Location	Andover, MA	Ground EL:		Logged By:	K. Griffiths
Project Number:	289302	Riser EL:		Page:	1 of 1



LOCKED PROTECTIVE CASING

SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 1

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 3

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 5

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 15

BOTTOM OF BOREHOLE: 15

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

Remarks: Bedrock encountered at 7 fbgs
PVC Stick up at 3.15 feet
Depth to Water : 10.55 feet

CDM Smith

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Suite 701
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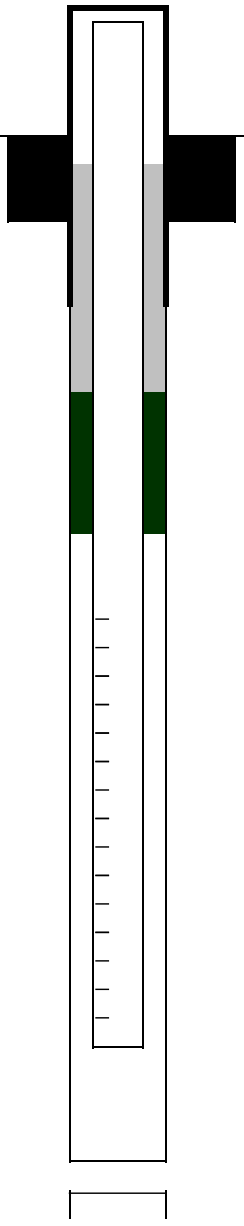
(617) 452-6000

Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	CDM-18S
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	11/12/2024
Project Location	Andover, MA	Ground EL:		Logged By:	K. Griffiths
Project Number:	289302	Riser EL:		Page:	1 of 1



SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 8

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 10

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 12

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 22

BOTTOM OF BOREHOLE: 22

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

Remarks:
PVC Stick up at 3.15 feet
Depth to Water: 17.9 feet

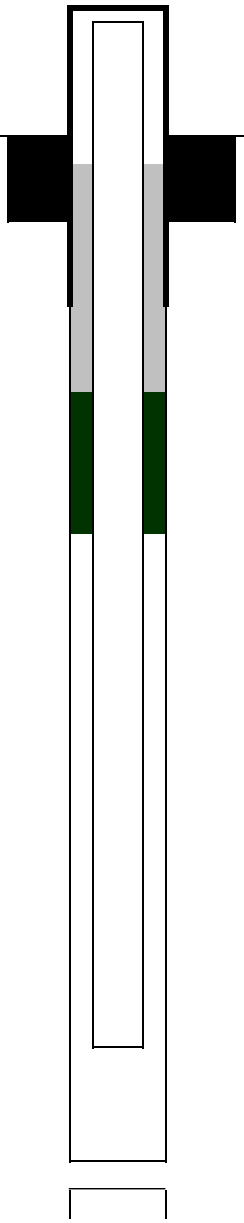
Appendix L Landfill Gas Monitoring Well Installation Logs

CDM Smith

75 State Street
Suite 701
Boston, MA 02109
(617) 452-6000

Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	LFG-1
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	11/15/2024
Project Location	Andover, MA	Ground EL:		Logged By:	K. Griffiths
Project Number:	289302	Riser EL:		Page:	1 of 1



SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 1

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 2

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 3

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 6

BOTTOM OF BOREHOLE: 6

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

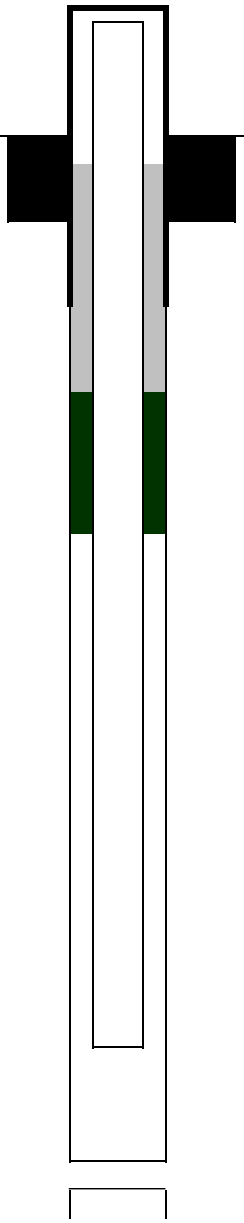
Remarks: PCV Stick up at 2.35 feet

CDM Smith

75 State Street
Suite 701
Boston, MA 02109
(617) 452-6000

Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	LFG-2
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	11/15/2024
Project Location	Andover, MA	Ground EL:		Logged By:	K. Griffiths
Project Number:	289302	Riser EL:		Page:	1 of 1



LOCKED PROTECTIVE CASING

SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 1

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 2

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 3

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 7

BOTTOM OF BOREHOLE: 7

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

Remarks: PCV Stick up at 2.8 feet

CDM Smith

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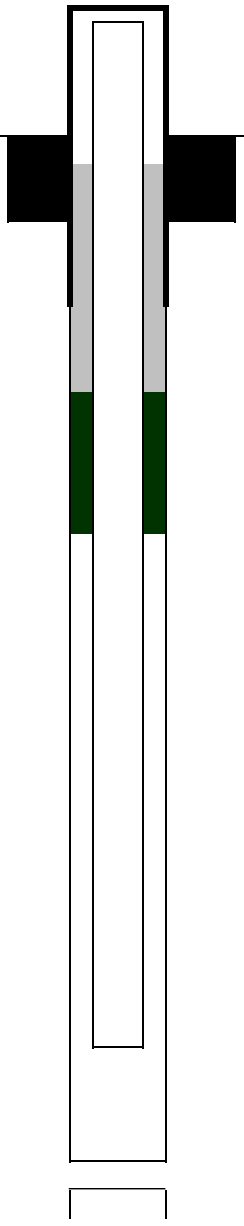
Suite 701
Boston, MA 02109
(617) 452-6000

Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	LFG-3
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	11/18/2024
Project Location	Andover, MA	Ground EL:		Logged By:	E. Treble
Project Number:	289302	Riser EL:		Page:	1 of 1



GROUND SURFACE

LOCKED PROTECTIVE CASING

SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 1

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 2

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 3

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 7

BOTTOM OF BOREHOLE: 7

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

Remarks: PVC Stick up at 2.83 feet

CDM Smith

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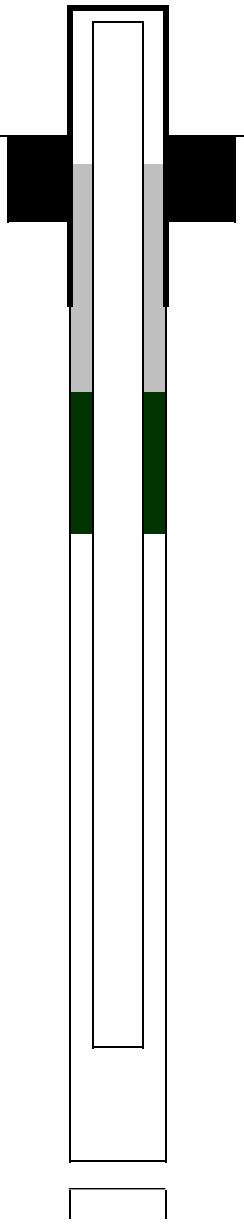
Suite 701
Boston, MA 02109
(617) 452-6000

Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	LFG-4
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	11/18/2024
Project Location	Andover, MA	Ground EL:		Logged By:	E. Treble
Project Number:	289302	Riser EL:		Page:	1 of 1



GROUND SURFACE

LOCKED PROTECTIVE CASING

SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 1

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 2

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 3

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 7

BOTTOM OF BOREHOLE: 7

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

Remarks: PVC Stick up at 2.91 feet

CDM Smith

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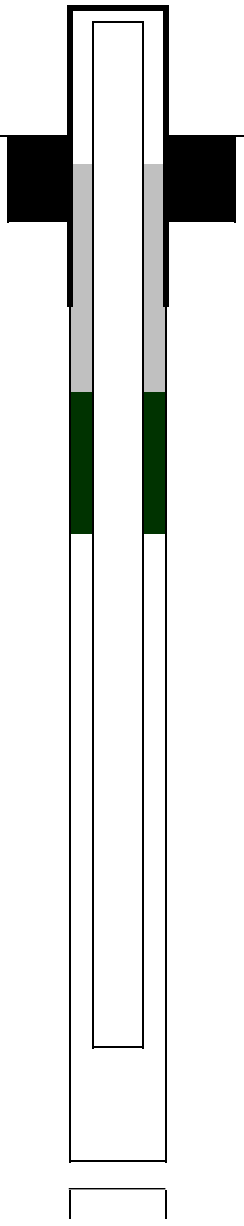
Suite 701
Boston, MA 02109
(617) 452-6000

Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	LFG-5
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	11/18/2024
Project Location	Andover, MA	Ground EL:		Logged By:	E. Treble
Project Number:	289302	Riser EL:		Page:	1 of 1



GROUND SURFACE

LOCKED PROTECTIVE CASING

SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 1

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 2

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 3

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 7

BOTTOM OF BOREHOLE: 7

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

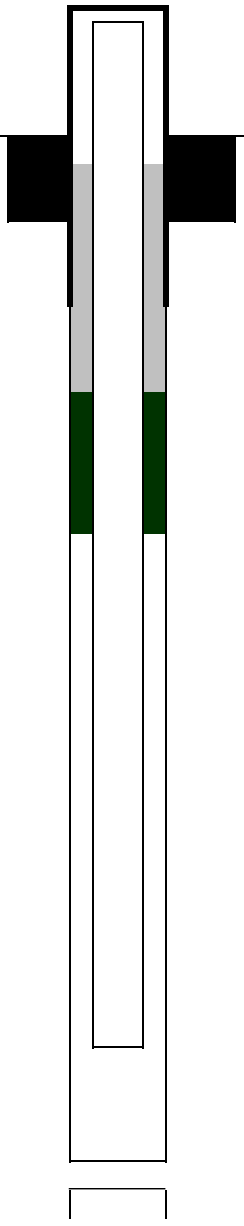
Remarks: PVC Stick up at 2.53 feet

CDM Smith

75 State Street
Suite 701
Boston, MA 02109
(617) 452-6000

Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	LFG-6
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	11/18/2024
Project Location	Andover, MA	Ground EL:		Logged By:	E. Treble
Project Number:	289302	Riser EL:		Page:	1 of 1



LOCKED PROTECTIVE CASING

SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 1

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 2

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 3

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 7

BOTTOM OF BOREHOLE: 7

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

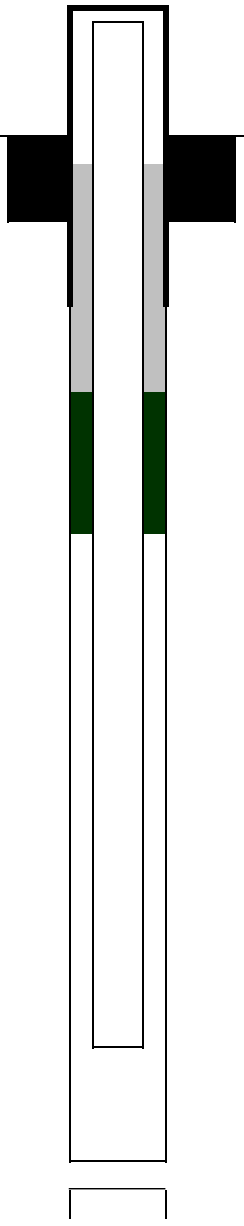
Remarks: PVC Stick up at 2.82 feet

CDM Smith

75 State Street
Suite 701
Boston, MA 02109
(617) 452-6000

Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	LFG-7
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	11/19/2024
Project Location	Andover, MA	Ground EL:		Logged By:	E. Treble
Project Number:	289302	Riser EL:		Page:	1 of 1



LOCKED PROTECTIVE CASING

SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 1

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 2

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 3

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 7

BOTTOM OF BOREHOLE: 7

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

Remarks: PVC Stick up at 2.87 feet
Groundwater encountered at 8.8 fbgs

CDM Smith

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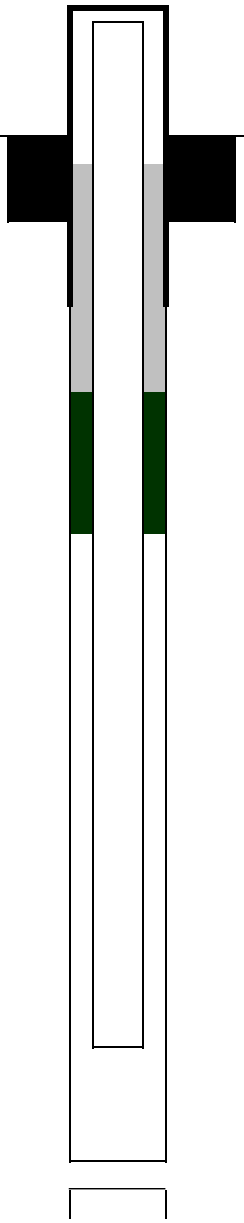
Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	LFG-8
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	11/19/2024
Project Location	Andover, MA	Ground EL:		Logged By:	E. Treble
Project Number:	289302	Riser EL:		Page:	1 of 1



GROUND SURFACE

LOCKED PROTECTIVE CASING

SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 1

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 2

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 3

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 6

BOTTOM OF BOREHOLE: 6

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

Remarks: PVC Stick up at 2.63 feet

CDM Smith

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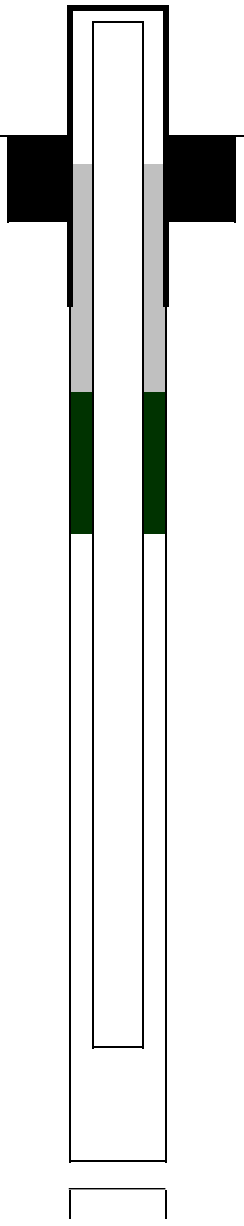
Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	LFG-9
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	11/19/2024
Project Location	Andover, MA	Ground EL:		Logged By:	E. Treble
Project Number:	289302	Riser EL:		Page:	1 of 1



GROUND SURFACE

LOCKED PROTECTIVE CASING

SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 1

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 2

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 3

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 6

BOTTOM OF BOREHOLE: 6

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

Remarks: PVC Stick up at 2.92 feet
Groundwater encountered at 7.5 fbgs

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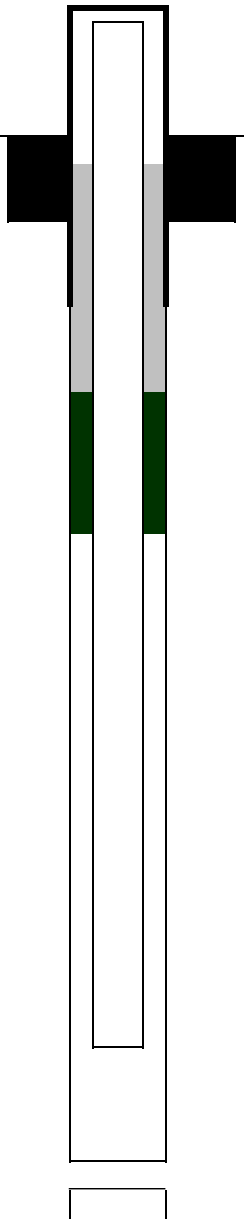
Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	LFG-10
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	11/20/2024
Project Location	Andover, MA	Ground EL:		Logged By:	K. Griffiths
Project Number:	289302	Riser EL:		Page:	1 of 1



LOCKED PROTECTIVE CASING

SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 1

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 2

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 3

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 7

BOTTOM OF BOREHOLE: 7

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

Remarks: PCV Stick up at 3.4 feet

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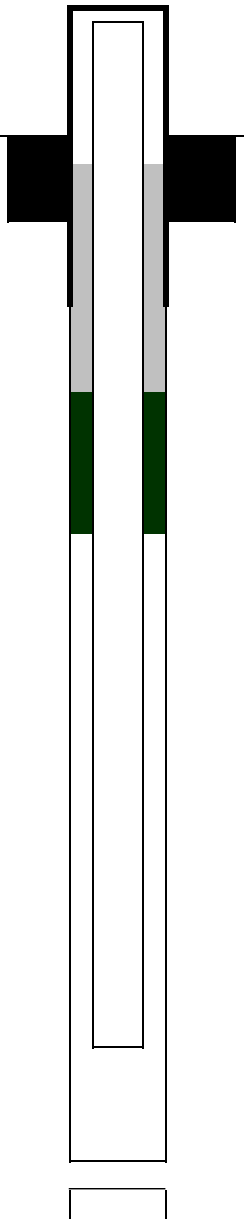
Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	LFG-11
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	11/20/2024
Project Location	Andover, MA	Ground EL:		Logged By:	K. Griffiths
Project Number:	289302	Riser EL:		Page:	1 of 1



GROUND SURFACE

LOCKED PROTECTIVE CASING

SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 1

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 2

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 3

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 8

BOTTOM OF BOREHOLE: 8

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

Remarks: Groundwater encountered at approximately 10 fbgs
PVC Stick up at 2.9 feet

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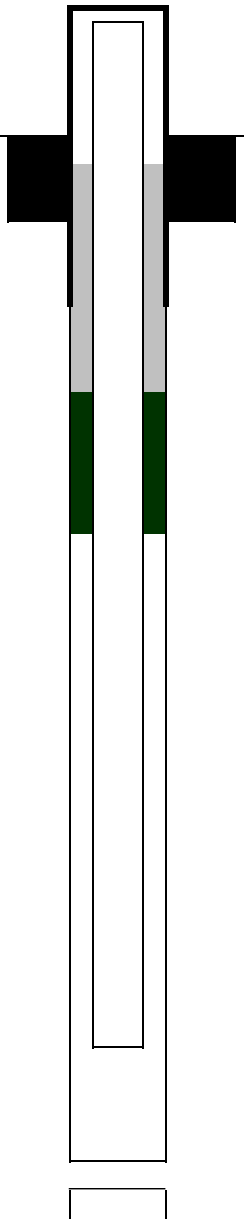
Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	LFG-12
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	11/20/2024
Project Location	Andover, MA	Ground EL:		Logged By:	K. Griffiths
Project Number:	289302	Riser EL:		Page:	1 of 1



LOCKED PROTECTIVE CASING

SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 1

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 2

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 3

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 7

BOTTOM OF BOREHOLE: 7

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

Remarks: PVC Stick up at 3.0 feet

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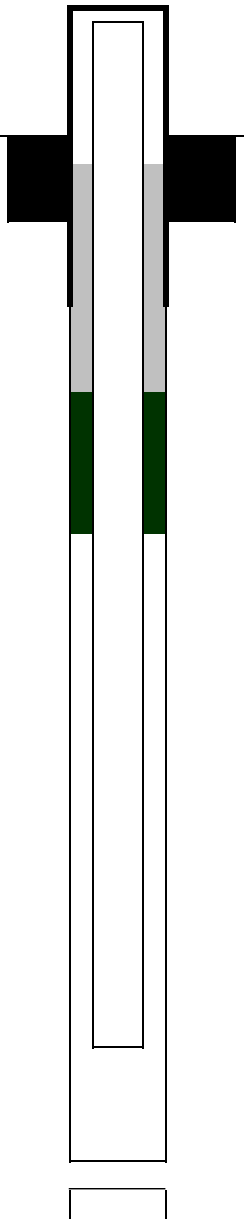
Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	LFG-13
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	11/20/2024
Project Location	Andover, MA	Ground EL:		Logged By:	K. Griffiths
Project Number:	289302	Riser EL:		Page:	1 of 1



LOCKED PROTECTIVE CASING

SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 1

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 2

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 3

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 8

BOTTOM OF BOREHOLE: 8

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

Remarks: PVC Stick up at 2.75 feet

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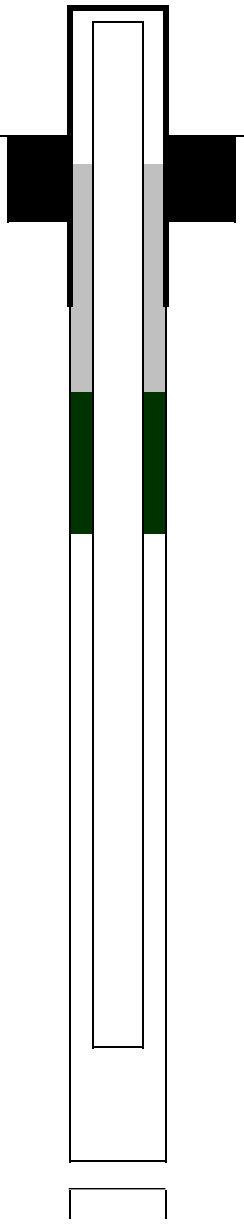
Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	LFG-14
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	11/20/2024
Project Location	Andover, MA	Ground EL:		Logged By:	K. Griffiths
Project Number:	289302	Riser EL:		Page:	1 of 1



LOCKED PROTECTIVE CASING

SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 1

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 2

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 3

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 10

BOTTOM OF BOREHOLE: 10

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

Remarks: PVC Stick up at 2.5 feet

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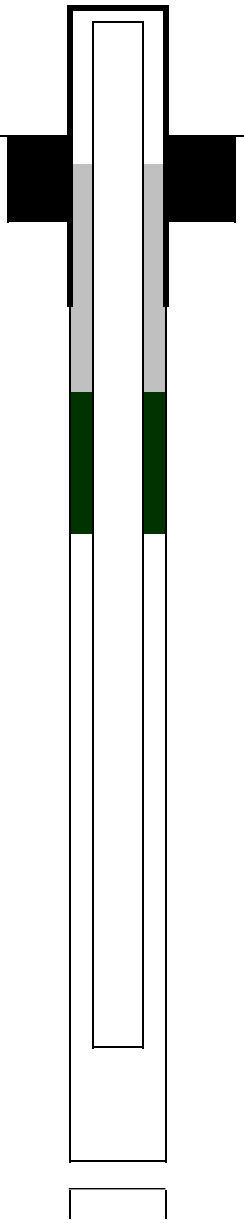
Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	LFG-15
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	1/6/2025
Project Location	Andover, MA	Ground EL:		Logged By:	K. Griffiths
Project Number:	289302	Riser EL:		Page:	1 of 1



GROUND SURFACE

LOCKED PROTECTIVE CASING

SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 1

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 2

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 3

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 8

BOTTOM OF BOREHOLE: 8

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

Remarks: PVC Stick up at 2.9 feet

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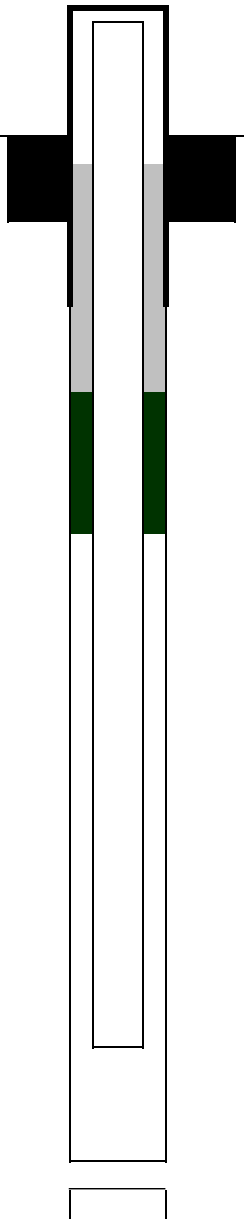
Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	LFG-16
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	1/6/2025
Project Location	Andover, MA	Ground EL:		Logged By:	K. Griffiths
Project Number:	289302	Riser EL:		Page:	1 of 1



SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 1

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 2

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 3

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 8

BOTTOM OF BOREHOLE: 8

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

Remarks: PVC Stick up at 2.7 feet

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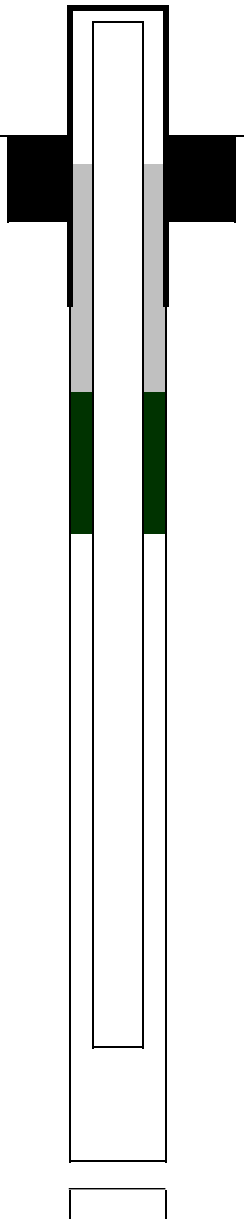
Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	LFG-17
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	1/7/2025
Project Location	Andover, MA	Ground EL:		Logged By:	E. Treble
Project Number:	289302	Riser EL:		Page:	1 of 1



LOCKED PROTECTIVE CASING

SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 1

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 2

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 3

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 8

BOTTOM OF BOREHOLE: 10

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

Remarks: The bottom of borehole was backfilled with sand (8-10 fbgs) underneath the screen.
PVC Stick up at 2.7 feet

CDM Smith

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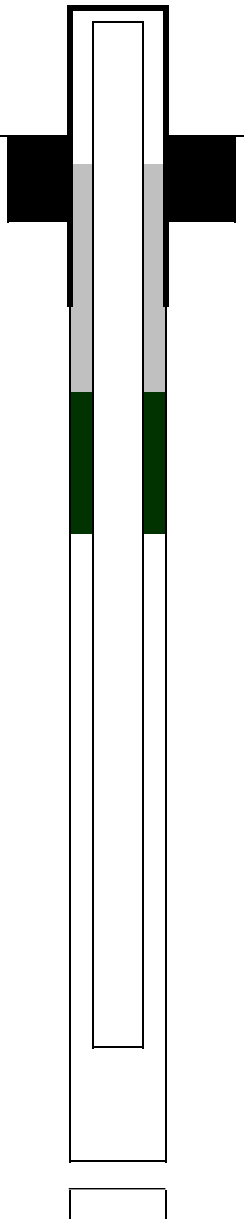
Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	LFG-18
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	1/7/2025
Project Location	Andover, MA	Ground EL:		Logged By:	E. Treble
Project Number:	289302	Riser EL:		Page:	1 of 1



GROUND SURFACE

LOCKED PROTECTIVE CASING

SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 1

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 2

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 3

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 8

BOTTOM OF BOREHOLE: 14

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

Remarks: The bottom of borehole was backfilled with sand (8-14 fbgs) underneath the screen.
Depth to Water: 9.8 fbgs
PVC Stick up at 2.6 feet

CDM Smith

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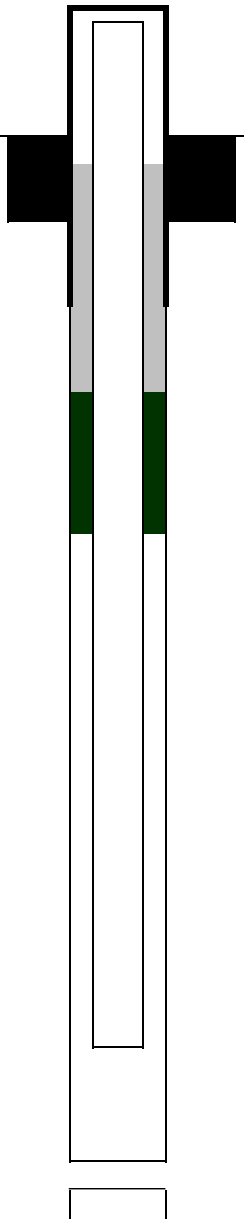
Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	LFG-19
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	1/7/2025
Project Location	Andover, MA	Ground EL:		Logged By:	E. Treble
Project Number:	289302	Riser EL:		Page:	1 of 1



LOCKED PROTECTIVE CASING

SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 1

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 2

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 3

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 8

BOTTOM OF BOREHOLE: 12

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

Remarks: The bottom of borehole was backfilled with sand (8-12 fbgs) underneath the screen.
PVC Stick up at 2.8 feet

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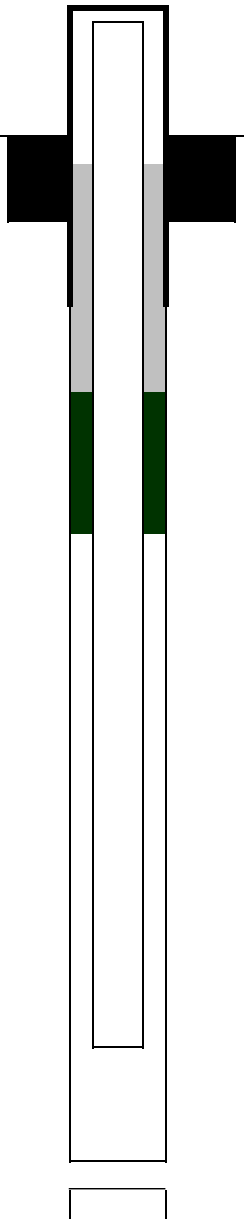
Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	LFG-20
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	1/8/2025
Project Location	Andover, MA	Ground EL:		Logged By:	K. Griffiths
Project Number:	289302	Riser EL:		Page:	1 of 1



GROUND SURFACE

LOCKED PROTECTIVE CASING

SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 1

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 2

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 3

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 8

BOTTOM OF BOREHOLE: 8

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

Remarks: PVC Stick up at 2.9 feet

CDM Smith

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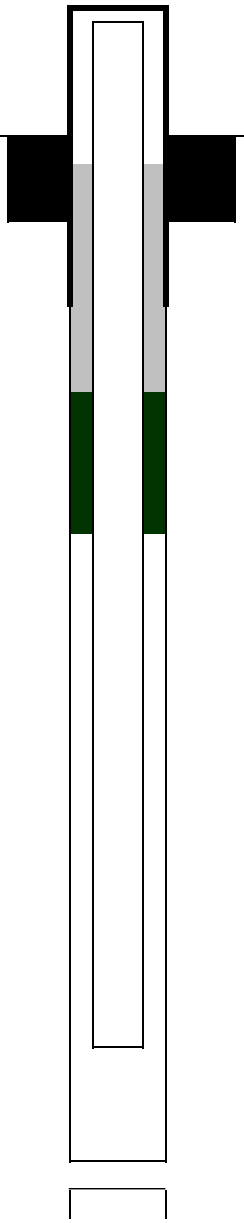
Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	LFG-21
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	1/8/2025
Project Location	Andover, MA	Ground EL:		Logged By:	K. Griffiths
Project Number:	289302	Riser EL:		Page:	1 of 1



GROUND SURFACE

LOCKED PROTECTIVE CASING

SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 1

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 3

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 4

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 12

BOTTOM OF BOREHOLE: 12

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

Remarks: PVC Stick up at 2.9 feet

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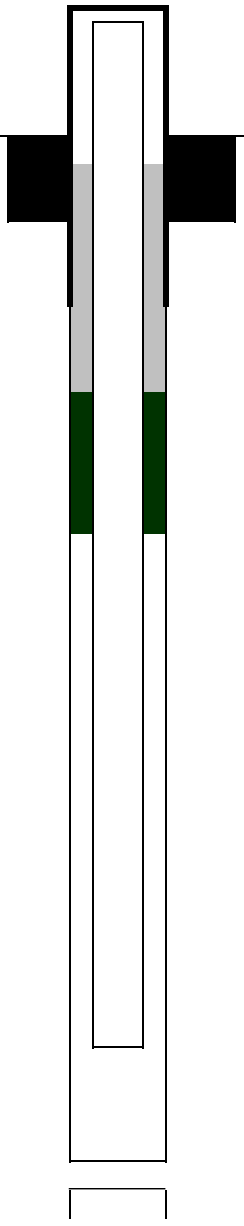
Monitoring Well Installation Log

Client:	Town of Andover	Contractor:	Geosearch	Boring/Well No.:	LFG-22
Project Name:	Ledge Road LF	Driller:	M. DeaMicis / S. Taylor	Date Installed:	1/8/2025
Project Location	Andover, MA	Ground EL:		Logged By:	K. Griffiths
Project Number:	289302	Riser EL:		Page:	1 of 1



GROUND SURFACE

LOCKED PROTECTIVE CASING

SURFACE SEAL: Grout
(Thickness & Type)

TOP OF SEAL: 1

SEAL CONSTRUCTION: Bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 2

RISER CONSTRUCTION: 2" SCH 40 PVC
(Type, Diameter & Material)

TOP OF SCREEN: 3

SANDPACK TYPE: Sand (#1)

SCREEN MATERIAL: 2" SCH 40 PVC, 10 slot
(Type, Slot, Diameter & Material)

BOTTOM OF SCREEN: 9

BOTTOM OF BOREHOLE: 9

BOREHOLE DIAMETER: 4"

NOTE: All depths are in feet below ground surface (fbgs), unless noted otherwise.

Remarks: PVC Stick up at 2.9 feet